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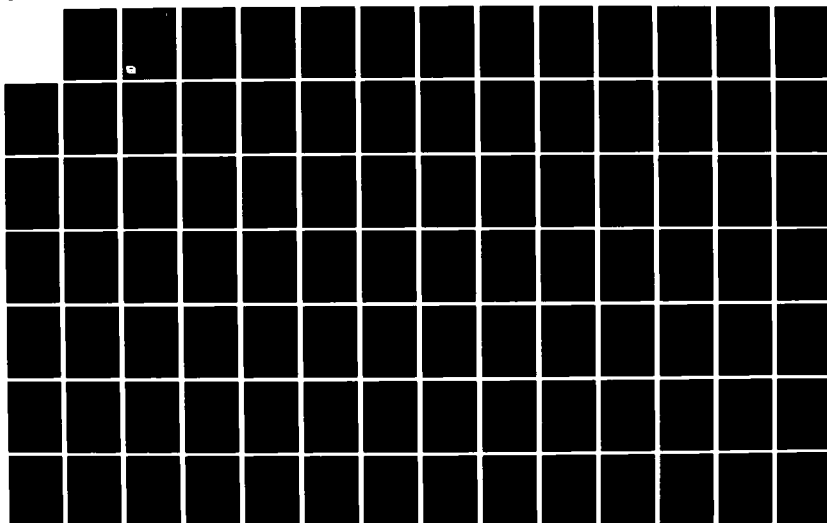
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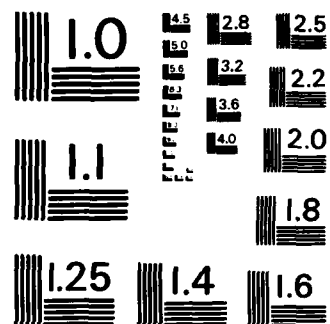
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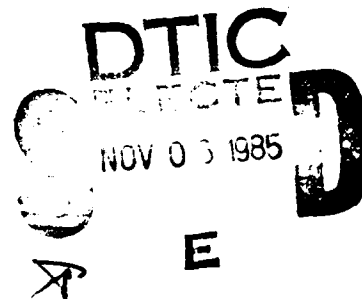
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REPORT OF THE JOINT INDUSTRY - DoD TASK FORCE ON
COMPUTER AIDED LOGISTIC SUPPORT (CALS)

Volume IV: Report of Information Requirements Subgroup

Frederick R. Riddell
Richard A. Gunkel
George Beiser
Siegfried Goldstein
Bruce Lepisto
Editors

June 1985



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Prepared for
Assistant Secretary of Defense
Manpower, Installations and Logistics

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19. ABSTRACT (Continue on reverse if necessary and identify by block number) In April 1984 the Institute for Defense Analyses was directed by OSD to assemble a task force of senior industry and government people to address the problems faced by DoD in attaining an integrated computer-aided logistics support system. The task force was given a charter to "develop a strategy and a recommended master plan for computer-aided (continued)				
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Item #19 (continued)

logistic support " The task force was formed and held an intensive series of meetings during the last half of 1984 during which this report was prepared.

Volume I of the report gives a summary of the task force deliberations and lays out a recommended strategy and master plan that would, in five years, have in place all the elements needed for a complete computer-aided logistics support (CALS) system based on electronic data transfer. Volumes II, III, IV and V of the report were prepared by the subgroups that were formed to examine different aspects of implementing a CALS system. These volumes contain detailed information that supports the recommendations made in the Summary, Volume I.

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PREFACE

This report was prepared by the Institute for Defense Analyses (IDA) for the Office of the Secretary of Defense, Manpower, Reserve Affairs and Logistics Under Contract Number MDA 903 84 C 0031, Task Order T-3-192, "R&D Support to Improve Force Readiness."

The issuance of the report answers the specific task to "...assemble a group of both industry and government personnel...experienced in...computer-aided technologies for automation of support procedures in order to examine issues...include(ing) the subcontractor level, inventory management techniques, etc. At present these issues are being addressed individually without apparent consideration of their interaction in meeting the total DoD objective...to evolve a general plan for automated support of DoD operating systems which addresses the problems of interaction between the different systems now in use or evolving, and the various approaches being taken by DoD to address its readiness problems."

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INFORMATION REQUIREMENTS

A. INTRODUCTION

It was determined very early in the CALS study that a precursor for any final recommendations on the future of CALS was to be able to define the DoD requirements for logistic information. These definitions would have to go beyond the traditional approach of defining a data product to support a specific logistic function; it would need to get to the basic information requirement behind that data product. In addition, any information determined necessary for logistic support purposes should be related to equivalent data used in design and manufacturing.

In trying to scope the effort to define information requirements, it became obvious that the job divided neatly into two efforts. For the long term, information needed for logistic support can be said to be inherent in product definition data; therefore, the long term effort should be in assuring that interface standards for engineering, design, manufacturing, and field operations are sufficient to provide basic information necessary to plan and design the support system. In the short and mid-term, DoD and the Services must ensure that the various mechanisms for acquiring data (currently by imposing various Military Standards and Data Item Descriptions) are geared toward the acquisition of basic information. To this end, the general approach that was chosen was to begin with today's data requirements (since these contain the complete though potentially redundant information requirement) and proceed to identify overlaps, breakdown to basic requirements and recommend the short and mid-term actions to modernize the requirements.

B. METHODOLOGY

1. Overview of Subgroup Actions

Due to the compressed schedule for the CALS effort, the Information Requirements Subgroup initiated several parallel actions. Although these actions were planned separately, their products were all geared towards definition of the CALS information requirements. The actions taken fall primarily into five categories:

- (1) Identification of products/data requirements levied on contractors;

- (2) Evaluation of a structured versus a non-structured approach to data delivery/utilization;
- (3) Examination of the utility of a universal numbering system for data exchange;
- (4) Identification of data duplication between the LSAR and its referenced military standards; and
- (5) Relationship of military standards.

The first two categories document how we do business today, and what technology techniques are being employed today to enhance our information handling capabilities and to identify our directions for tomorrow with the associated issues.

The third category, Universal Numbering System, explored the increasing problem of data exchange and the resulting need for a mechanism to overcome this problem.

Category 4 was a detailed analysis tracing the LSAR data elements to functional areas, identifying duplication, and recommending opportunities for automation and reduction of duplicate data requirements.

Category 5 was in support of Category 4 in that it identified the relationships of the logistic-oriented Military Standards to each other and to the Military Standards. This is critical in defining potential new interfaces with the LSAR and for highlighting potential duplication areas that should be eliminated.

2. Specific Subgroup Actions

Action #1

Using the MS-1388 as an example, explore and define the sources and uses of the data and recommend changes/improvements (possibly t_0, t_1, t_2).

Action: Craig Hunter.

Reports: Appendix A to this volume.

Action #2

Assume availability of digitized data system for input and processing; what will be impact when time for delivery of data is closer to user need? For example:

- closer to final configuration
- fewer changes/updates required
- faster preparation and distribution of products (parts lists, manuals, handbooks, etc.).

What are the specific opportunities and what do the Services and DoD agencies need to do to take full advantage?

Action: Dan McDavid.

Action #3

Identify other areas where "MS-1388-like" documents may be required and recommend steps to develop. Two steps:

Action #3A

Identify current MIL STDs which generate significant reporting requirements (such as MIL-STD-1388-2A, MIL-STD-965, etc.).

Action: Jim Dalgety.

Reports: Appendix B to this volume.

Action #3B

Identify requirement to recombine the above and/or create a new MIL STD or MIL STDs defining data requirements for other disciplines in addition to logistics.

Action: All members (ongoing).

Action #4

Develop a recommendation and supporting documentation to achieve a universal numbering system for systems, subsystems and components (ala FINDER).

Action: Col. Hernandez.

Reports: Appendix C to this volume.

Action #5

Using the following statement of intent/capability, develop example data requirement descriptions:

STATEMENT OF INTENT/CAPABILITY

In order for agencies of the DoD and their contractors to make maximum effective use of computer-generated logistics data, DoD should specify the neutral format in which the data are delivered. This information (i.e., which neutral formats) is crucial to contractor decisions on which form of automation to invest in. Careful selection of standard formats will enhance the ability of the DoD branches, contractors and subcontractors to deal with each other efficiently so as to make maximum use of the data

without expensive processing. Therefore, a review of the data deliverables which support/document the nine ILS elements to identify those which are candidates/will be delivered in neutral format, will be accomplished.

Reports: Appendix D to this volume.

Action #6

Another slice/view of the data requirements issue will be obtained by selecting two or three of the functions identified in the Architecture Group paper. The functions will be selected on the basis of heavy interaction between DoD and contractors (e.g., supply support and training). The data requirements for each of those functions will then be described via a think-piece/white paper for the two extremes of data requirements.

Action #6A

A fully structured data requirement system, i.e., where specific data deliverables ala MIL-STD-1388 and other packages are identified and specified much as they are today, except more clearly.

Action: Terry Granger.

Action #6B

An unstructured (ad hoc) system where a central or integrated distributed data base is used in free form and each user can design and acquire the data that he needs on a demand basis. Each of the extremes will be discussed from the point of view of its attributes, advantages, disadvantages, issues, technology requirements, time frame in system life cycle, etc., as well as its utility vis-a-vis each selected function.

Action: Col. Reynolds (Chair); Dick Gunkel.

Reports: Appendix E to this volume.

Action #7

Finally, in order to describe how CALS might work if it met the intent/capability outlined above, a paper on the B-1B will be developed.

Action: John Willis.

Report: Appendix F to this volume.

Action #8

In order to develop a weapon system view of CALS: Request that each Service select a recent weapon system where data packages are being or recently have been delivered. Then request that the following information/data be provided for three areas: (1) Supply Support, (2) Training, (3) Technical Data. For each of the areas:

1. Identify the CDRL deliverables.
2. For each deliverable:
 - provide a description of the item;
 - describe how the contractor developed the item (manual, automated, mix, unique/innovative approach).
 - describe how (in what form) it was delivered, i.e., paper, magnetic tape, disk, TNS by phoneline, etc.;
 - once in Government hands, describe how any or all of it was/is entered into a digital data system;
 - using current/evolving technology, describe how we can greatly improve the data development, delivery to the Government, and use by the Government.

All of the above actions were not targeted per se at a "CALS Data Base," but rather at the identification of actions necessary to allow the DoD to evolve to such identification.

C. DISCUSSION OF EFFORTS

1. Summary of Information Requirements Action Items From Contractor's View

Inputs from three major defense contractors were received. Each looked at specific weapon system information requested by the government. One contractor focused on Navy, one on Air Force and one covered both (see Appendix D). The inputs focused on the Contract Data Requirements List (CDRL) and the specific MIL STDs and specifications that describe/outline/specify the format and content of the required data. The inputs were presented by functional area, i.e., support equipment, training, provisioning, etc.

The required data items were further reviewed for:

- (1) Current degree of automation/digitization within their company.
- (2) Their view of readiness of government to accept the data in digital format.
- (3) Their view of the need/potential opportunities for digitizing the item.
- (4) Potential legal and/or policy changes required to move to digital delivery.

The findings of all three companies were very similar. Although there are differences in the level of automation, all were moving quickly to automation of the processes that develop the data elements which in turn comprise the data items delivered to the government. Few of the company efforts started out being aimed at specific DID; they quite naturally were aimed at internal, usually functional, organizations trying to speed or improve their products. The companies generally agreed that they are ready to deliver much of the data digitally, but the Services are not yet prepared. They also see excellent opportunities for further productivity and quality improvements across the board. Finally, they found very little legal or policy impediments but all agreed that the political/NIH, etc., issues were strong.

2. Data Structure

There are three interrelated papers exploring the aspects of the way we currently handle data and projecting how we should handle data in the future.

The paper on shared data by John Willis (see Appendix F) emphasizes that the government data requirements are presently forms-driven. This "form" format, so useful in the paper environment, is far too inflexible in the electronic environment. In order to take advantage of current computer technologies and get away from information systems that serve organization-discrete user needs, the Air Force and Rockwell are developing an Integrated Design Support System (IDS). IDS will be applied to the development of the logistics data requirements of the B-1B bomber. The IDS program is designed to prove the utility of non-traditional methods of data base management.

The paper on structured data by Terry Granger (see Appendix E) outlines some of the ways the Air Force handles data and some of the Air Force's ongoing automation efforts. The basic conclusion is that the Air Force is retaining the paper-based nature, i.e., forms format, in its data requirements. The inherent inflexibility of this format hinders efforts to develop data bases which reduce redundancies and foster information exchange.

The paper on unstructured data by Colonel Reynolds (see Appendix E) looks not at current processes but at the weapon system development in light of data processing technology as it is exploding in the 1980s. The intuitive conclusion is that modern computer-based design and manufacturing systems "halve the cost--with quantum increases in designed reliability."

3. Universal Numbering System

Over the last ten years, both DoD and DoD contractors have invested in information automation. These efforts have largely stemmed from functional productivity demands and have, today, evolved into a series of "functional foxholes" with little ability to cross-feed current data among these foxholes. As we look to the future, the interests of the "Total Enterprise or Weapon System Program" must surface as the driving factor in integrating these evolutionary efforts. The industrial world is rapidly moving towards central¹ integrated data bases, data base management systems and on-line distributed access to information. There is a fundamental requirement to describe the routes in and out of these information systems. Users, regardless of their corporate or government functional interests, must be provided the capability to perform their functional tasks efficiently and quickly as the "Enterprise or Weapon System Program" takes control of the information system's architecture. Because previous investment in functional systems will not be scrapped, there is a need to tie routing in and out to a universal numbering system or data dictionary that will allow the functional manager to see what he wants, when he wants it and to perform his immediate tasks without destroying huge investments in current data files, titles and coding.

This universal tie to existing data elements must be done in such a way that the working level employee will embrace, use and exploit the enormous benefits inherent in having functional information accessible, current and relevant to his functional tasking and responsibilities.

4. LSAR Data Interface

a. Purpose

The purpose of the LSAR data interface was to identify and define the data element interfaces between MIL-STD-1388-2A and other military standards and their associated Data Item Descriptions (DIDs), and, having identified the data element interfaces, to analyze data element redundancies and document redundancies and areas of data delivery that could result in automation opportunities.

¹NOTE: Central, in many cases, only as related to control. In fact many are physically decentralized.

b. Approach

The first step in the effort was to develop an LSAR data interface matrix that defined the data element interfaces with the data in other military standards. The matrix (see Appendix A) contains all of the LSAR data elements in MIL-STD-1388-2A, the sources for the data, whether or not the data element is the same, similar or generically similar to data in one or more of 21 MIL-STDs reviewed, and whether or not the data element was delivered in one or more of 47 DIDs. The categories of similar and generically similar data elements involved a degree of mathematical calculation or interpretation that is required to arrive at the data element. For example, the difference between failure factor and maintenance replacement rate is a constant multiplier/divider of 100, while the difference between failure rate and failure factor involves a more detailed mathematical equation which also includes subjective factors for environment, pilferage, learning curve, etc.

With the matrix completed it became evident that there were eight functional areas of interface with the LSAR data. These were defined as:

- (1) supply support
- (2) support equipment
- (3) technical data
- (4) transportability
- (5) packaging
- (6) reliability
- (7) maintainability
- (8) manpower and training.

A more detailed analysis of the LSAR data interface within these areas was conducted with a view toward identifying the degree of redundancy and therefore possible elimination of documents and, secondly, automation opportunities. The details of this effort are contained in the appendices to this document. Finally, the automation opportunities were prioritized in terms of short term and long term (i.e., near term) efforts that could be accomplished.

c. Analysis Results

While duplication/redundancy was found in all functional areas, the largest areas of duplication were in reliability (i.e., MIL-STD-1629A), maintainability (i.e., MIL-STD-470) and support equipment (i.e., MIL-STD-2097) with respect to MIL-STD-1388-2A. The resulting recommendations were as follows:

- a. Eliminate MIL-STD-1629A by incorporating the analysis requirements into MIL-STD-78S.
- b. Eliminate the maintainability analysis requirements from MIL-STD-1629A as it is covered by MIL-STD-470.
- c. Eliminate MIL-STD-2097 and incorporate its analysis requirements into MIL-STD-1388-1A.

Automation opportunities centered around the need to establish/enhance functionally oriented "data bases" that would contain all weapon system data and serve as baseline information. These data would be used by the LSA activities along with engineering data (i.e., CAD/CAD/CAM) to provide automated logistics outputs either as data delivered or data accessed.

5. Military Standards Relationships

a. Purpose

The purpose of this task was to identify current military standards which generate significant data reporting requirements over and above the LSAR data interface relationships already addressed (see Appendix B).

b. Approach

The DoDISS was manually reviewed by standardization areas to identify MIL-STDs with broad applicability. This resulted in the identification of 76 standards which were then grouped into 17 functional areas, defined as follows:

- a. Nondestructive test
- b. Test
- c. Environmental test
- d. Electromagnetic test
- e. Quality control
- f. Automated test
- g. Certification
- h. Configuration management
- i. WBS
- j. Finance
- k. Drawings/bills of material
- l. Standards
- m. Maintainability

- n. Reliability
- o. Safety
- p. Marking
- q. Packaging.

Each area can be directly or indirectly related by the data requirements which each standard generates.

c. Analysis Results

Analysis of the data relationships among the 76 MIL-STDs is an area that still needs to be addressed and is beyond the scope of the group. Such an analysis should include identification of "key" elements that are common to all STDs. Such an effort could lead to development of a substance-oriented data element dictionary that could be embodied in a new version of MIL-STD-1388-2A.

D. FINDINGS/CONCLUSIONS

1. Contractor's Perspectives

- 1. Although there are differences in the degree of automation currently achieved within industry, most Primes are moving rapidly toward automating processes to deliver data to the government.
- 2. Industry assessments claim a current capability to deliver some digital data which the Military Services are not prepared to accept.
- 3. Automation of information handling will provide for across-the-board productivity and quality improvements.
- 4. Legal and policy issues are minimal and are not considered an impediment.

2. Data Structure

- 1. Even though transition to digitized data bases is occurring, the prevailing mentality of information management remains in the paper medium.
- 2. Information systems need to be data-driven rather than organization- or application-driven.
- 3. Logistics data can be expected to transition from information (the "what") to acknowledge (the "how") in recognition of the capability of capture to an embedded knowledge base in the design and manufacture of a weapons system.

3. Universal Numbering System

1. Recent efforts in information automation have been driven by functional demands that have evolved into a series of "functional foxholes" with little cross-feed capability.
2. User needs at all levels require rapid and effective routes into and out of data stored in the various data bases.
3. Because of the investment, existing functional systems will not be scrapped; there is a need for a universal numbering system or data dictionary to bridge the "foxholes."
4. Any universal system developed must preserve the integrity of existing data and must be user-friendly as defined by the functional user.

4. LSAR Data Interface

1. While duplication/redundancy exists in all functional areas, the most significant areas of duplication occur among areas of reliability (MIL-STD-1529A), maintainability (MIL-ST-470) and support equipment (MIL-STD-2097) with respect to LSAR data requirements (MIL-STD-1388-2A).
2. Automation opportunities center around functionally oriented data bases that would contain weapon system data and serve as baseline data.

5. Military Standards Relationships

1. Analysis of data relationships among the 76 MIL-STDs which generate significant data reporting requirements is an area that needs to be addressed. Such a study is beyond the scope of the current effort.

E. RECOMMENDATIONS

The recommendations of the Information Requirements Subgroup are focused in two areas: the elimination of duplicate data requirements and their attendant military specifications; and the establishment of Standard Informational needs by the Department of Defense. To accomplish these end results, both short and long term actions are required. It must be stressed that these actions are not sequential actions, but parallel actions which require coordination to assure a viable product.

1. Short Term Actions

1. Identify the interface between the LSAR and potential standard neutral formats (e.g., IGES, GKS, and GENCODE). The action should be based upon IGIS 2.1 released in December 1984. Initial evaluation should be completed by July 1985 (Army lead).

2. Representatives of the logistic community should participate in the design/evolution of the neutral formats to assure that logistic informational needs are satisfied. This will be an ongoing task that should be initiated immediately (OSD lead).
3. Eliminate current data duplication between the LSAR and those MIL-STDs currently referenced by MIL-STD-1368-2AA [e.g., MIL-STD-1629 (FMECA) and MIL-STD 2073, preservation and packaging]. This includes the exploitation of automation opportunities to streamline the data delivery process. In addition, this action will require the elimination and consolidation of current military standards. This should not be construed as a thrust to reorganize functions within the DoD, but rather to provide a single recognized vehicle to present needed information. This overall effort will require up to four years to complete. Appendix F contains the actual actions required, their priority, and proposed completion times (OSD lead).

2. Long Term Actions

1. Expand the short term action of 1(3) above to encompass those MIL-STDs associated with the referenced standards. This will utilize the MIL-STD relationship identified in Appendix B. Whereas action 1(3) will minimize the addition of data elements to the LSAR, this action could result in significant changes to the LSAR data system (OSD lead).
2. Establish the Standard Information needs of the Department of Defense. This includes establishment of: (a) a universal numbering (or equivalent) system to maintain an audit trail of information as it relates to itself and the hardware; (b) a DoD data element dictionary (or standard of specification) which identifies data nomenclature, definitions, field length/type, and identifier.

Appendix A

LSAR DATA INTERFACE

CONTENTS

Briefing on LSAR Data Interface.....	A-3
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Automated LSAR Data Sheets.....	A-29

COMPUTER AIDED LOGISTIC SUPPORT

(CALS)

LSAR DATA INTERFACE

LSAR DATA INTERFACE MATRIX

- PURPOSE: TO IDENTIFY THE LSAR DATA ELEMENT SIMILARITIES WITH DATA ELEMENTS CONTAINED IN OTHER MIL-STD'S, MIL-HDBK'S, AND THEIR ASSOCIATED DATA ITEM DESCRIPTIONS (DID'S).
- CONTENTS:
 - IDENTIFIES DATA SOURCES (I.E., REQUIREMENTS DOCUMENTS, PLANNING DOCUMENTS, OR ANALYSIS DOCUMENTS).
 - IDENTIFIES LSAR DATA ELEMENT INTERFACE WITH ILS ELEMENTS
 - IDENTIFIES LSAR DATA ELEMENT INTERFACE WITH MIL-STD'S AND THEIR ASSOCIATED DID'S.
 - SAME DATA ELEMENT.
 - SIMILAR DATA ELEMENTS (E.G., REQUIRE MODIFIERS TO OBTAIN SAME DATA ELEMENT).
 - GENERICALLY SIMILAR DATA ELEMENTS (E.G., WOULD REQUIRE MATHEMATICAL CALCULATION TO TRANSLATE.
 - IDENTIFIES LSAR DATA ELEMENTS

LSAR DATA INTERFACE MATRIX

AREAS OF AUTOMATION OPPORTUNITY

- RELIABILITY - MIL-STD-1629A, MIL-STD-785B, MIL-HDBK-217
- MAINTAINABILITY - MIL-STD-470, MIL-HDBK-472
- SUPPLY SUPPORT - MIL-STD-965, MIL-STD-1561, PARTS PROCUREMENT
PROCESS
- MAINTENANCE PLANNING - MIL-STD-1390, MIL-M-63038B
- TECHNICAL DATA - MIL-STD-335, TM/TB DEVELOPMENT
- SUPPORT EQUIPMENT - DI-S-3596A, SERD
- MANPOWER AND PERSONNEL - DI-H-7068 TASK AND SKILL ANALYSIS, MANPOWER
AND PERSONNEL DATA BASE
- PACKAGING - MIL-STD-2073

LSAR DATA INTERFACE AREA

SUGGESTED ANALYSIS FORMAT

- SUBJECT AREA
- INTERFACING DOCUMENTS
- INTERFACING DID'S
- INTERFACE ANALYSIS/DESCRIPTION
- AUTOMATION OPPORTUNITIES
- DOCUMENT REDUNDANCY

LSAR INTERFACE AREA EXAMPLE

SUBJECT: RELIABILITY - FMECA AND RELIABILITY PREDICTIONS

INTERFACE DOCUMENTS: MIL-STD-735B
MIL-STD-1629A
MIL-HDBK-217

INTERFACING DID'S: DI-R-7085, FMECA REPORT
DI-R-7082, RELIABILITY PREDICTION REPORT

LSAR INTERFACE AREA EXAMPLE

RELIABILITY (CONTINUED)

INTERFACE ANALYSIS/DESCRIPTION:

- MIL-STD-1588-2A AND MIL-STD-1629A CONTAIN SAME FMECA DATA ELEMENTS (I.E., DATA RECORDS B1 AND B2)
- LSAR B2 RECORD CAPTURES COMPONENT FAILURE RATES - B RECORD CAPTURE ITEM RELIABILITY VALUES TO INCLUDE END ITEM.
- LSAR B, B1 AND B2 ARE AUTOMATED DATA RECORDS.
- MIL-HDBK-217 IS MANUAL DATA SOURCE FOR ELECTRONIC FAILURE RATES.
- INTERFACING DID'S REQUIRE DELIVERY OF DATA IN HARDCOPY.

LSAR INTERFACE AREA EXAMPLE

RELIABILITY (CONTINUED)

AUTOMATION OPPORTUNITIES

- ALLOW AUTOMATED DELIVERY OF FMECA (DI-R-7085) - TAKES ADVANTAGE OF CONTRACTOR IN-HOUSE AUTOMATION CAPABILITIES.
- USE AUTOMATED LSAR DATA BASE AS SOURCE FOR CALCULATING END ITEM RELIABILITY.
- AUTOMATE MIL-HDBK-217 FAILURE RATE DATA.

DOCUMENT REDUNDANCY

- MOVE ANALYSIS REQUIREMENTS OF MIL-STD-1629A TO MIL-STD-785B
- DELETE MIL-STD-1629A

APPENDIX A

2. LSAR DATA INTERFACE ANALYSIS PRIORITIZATION OF AUTOMATION OPPORTUNITIES

AREA	PHASING	PRIORITY	PAGE
Supply Support	S	1	A-10
Support Equipment	S	2	A-13
Recommendation Data			
Technical Data (Process Automation)	S	3	A-15
Transportability	S	4	A-17
Packaging Requirements	S	5	A-18
Reliability	L	1	A-20
Technical Data (Product Automation)	L	2	
Maintainability	L	3	A-23
Manpower & Training	L	4	A-26

S - Short Term effort (1 year or less)

L - Long Term effort (1-4 years)

LSAR INTERFACE AREA

SUBJECT: Supply Support

1. **Interfacing Documents:** MIL-STD-965, Parts Control Program
MIL-STD-789C, Procurement Method
Coding of Replenishment Spare Parts
MIL-STD-1561B, Provisioning
Procedures, Uniform Department
of Defense
2. **Interfacing DID's:** DI-E-7027, Program Parts Selection List
DI-P-7128 Contractor Technical
Information
Coding of Replenishment Spare Parts.

DI-V-7002, Provisioning Parts List
DI-V-7003, Short Form Provisioning Parts List
DI-V-7004, Long Lead Time Items List
DI-V-7005, Repairable Items List
DI-V-7006, Interim Support Items List
DI-V-7007, Design Change Notices
DI-V-7011, Post Conference List
DI-V-7016, Provisioning and Other Procurement Screening
DI-V-7192, Provisioning Parts List Index
DI-V-7193, System Configuration Provisioning List

3. **Analysis of Interface:**
 - a. MIL-STD-965 identifies the requirement to develop a two part list of general and limited application spares and repair parts subdivided into categories of mechanical and electrical items for review by the items proponent agency for parts control and standardization. MIL-STD-789C defines the requirement to develop and document contractor technical information regarding selected parts for contractor furnished equipment in order to

expand competitive reprocurement possibilities for these items. MIL-STD-1561B prescribes nine provisioning lists comprised of specific categories of spare/repair parts. Eight of the nine lists are deliverable in an identical format. In addition, MIL-STD-1561B requires the contractor to perform provisioning screening of support items through the Defense Logistics Services Center (DLSC), as part of the support items standardization effort. The various lists are used by the requiring authority to accomplish provisioning. These requirements are applied selectively on DoD procurement contracts, RFP's, RFQ's, IFB's SOW's and Government in-house efforts for the development, production and initial deployment of systems and equipments.

b. The resultant data required by these standards are also contained in MIL-STD-1388-2A (LSAR data records H and H1). In addition, the Joint Service LSAR ADP system provides an automation system for the support item data, the LSAR Parts Master File.

c. The paragraph 2 DID's call for the delivery of hardcopy worksheets, listings or magnetic tape for categories of support items. The DI-V-7000 series DID's are satisfied by using the data contained in the LSAR data base. The resultant outcome of DI-E-7027 and DI-P-7128, e.g., PPSL and CTIC, AMC, AMSC, and the basic part identifying information are also contained in the LSAR.

4. Automation Opportunities

a. The Joint Service LSAR ADP system already provides the capability to automate the provisioning lists. The DID's refer specifically to the LSA-032/036/151 reports for data delivery or reference number prescreening requirements.

b. Automation of DLSC Screening results impacting the LSAR can be accomplished as a means of providing the feedback loop to the screening requirement.

c. Automation of the parts control program worksheet and contractor technical information record could be accomplished

with modifications to the LSAR. A skeletal or basic worksheet/record can be developed based on the present contents of the LSAR.

5. Document Redundancy: None.

LSAR INTERFACE AREA

SUBJECT: Support Equipment Recommendation Data (SERD)

1. Interfacing Documents: MIL-STD-2097 (proposed), Requirements for Acquisition of End Items of Support Equipment and Associated Integrated Logistics Support.

2. Interfacing DID: DI-S-3596A Support Equipment Recommendation Data.

3. Interface Analysis/Description:

a. MIL-STD-2097 prescribes the procedure, terms, and conditions governing the identification, selection, design, approval, ordering, delivery, and logistic support of end items of support equipment to support aeronautical systems and equipment. Among the acquisition and logistic requirements incorporated in this publication are greater emphasis on: (1) time concepts related to the process, (2) management cost and funding reports, (3) support equipment standardization, (4) support equipment design changes and configuration control, (5) critical item criteria, and (6) integrated logistic support. The SERD required by this standard provides key narrative and quantitative data used to propose and validate support equipment needs. The total SERD is intended to support overall systems management action regarding support equipment development, acquisition, and optimum standardization within and among systems.

b. MIL-STD-1388-2A Data Records B, E, and H contain the same data elements that would result from requirements of MIL-STD-2097. The Data Record B is used to capture the Mean Time Between Failure (MTBF) and Inherent Availability. Data Record E provides key narrative and quantitative data to validate support equipment recommendations. Data Record H will capture all provisioning related information.

c. Data Item DI-S-3596A requires delivery of a Support Equipment Recommendation Data document. The current Data Record E is not automated, therefore, an automated SERD cannot be produced from the LSAR. The data contained on Data Records B, E, and H can be used to produce a manual document to satisfy the DID requirements.

4. Automation Opportunities. The Joint Service LSAR ADP System will, in the future, provide the capability to automate the Support Equipment Recommendations Data. This automation will significantly reduce the effort required to generate the SERD document.

5. Document Redundancy. Data Item DI-S-3596A should be modified to reference use of the LSAR data items to generate a SERD document. MIL-STD-1388-2A contains all the data requirements of MIL-STD-2097. The analysis requirements of MIL-STD-2097 can be included in MIL-STD-1388-2A, thereby eliminating MIL-STD-2097.

LSAR INTERFACE AREA

SUBJECT: Technical Data, Technical Manual/Technical Bulletin Development

1. **Interfacing Documents:** MIL-STD-335, Repair Parts/
Special Tool List
MIL-M-63038B, Manuals, Technical
MIL-M-63036, Manuals, Operator
2. **Interfacing DID's:** DI-M-6152A, Manuals, Operation and Main-
tenance Instruction, Maintenance
Training
DI-M-1517 Technical Manuals
DI-M-3407C, Technical Orders
3. **Interface Analysis/Description:**
 - a. The interfacing documents establish format and content for technical manuals to include the individual lists and charts contained therein.
 - b. MIL-STD-1388-2A, Data Records C, D, D1, H and H1 contain the same data elements as those required by the interfacing documents in order to produce the necessary lists. Specifically, the LSAR C, D1 and H records are used to satisfy the MAC/TOOL List requirement. The D record captures the step-by-step maintenance procedures to support the narrative development effort. The H and H1 provides the information to satisfy the Repair parts/Special Tool List (RPSTL), Component of End Items List (COEIL), Additional Authorization List (AAL), Basic Issue Items List (BIIL) and Expendable Supplies and Materials List (ESML). Information not contained in the DoD LSAR includes table of content information, illustrations, and MAC remarks information.

c. Seven DID's associated with the -2A LSAR reports were established to satisfy the data requirements necessary to support the TM development effort.

LSA-004/020	MAC/TOOL List	DI-L-7189
LSA-015	Task Narrative Master File	DI-L-7159
LSA-030	Repair Parts/Special Tools List	DI-L-7188
LSA-040	Components of End Item List	DI-L-7170
LSA-041	Basic Issue Items List	DI-L-7171
LSA-042	Additional Authorization List	DI-L-7172
LSA-043	Expendable Supplies and Material List	DI-L-7173

4. Automation Opportunities. The Joint Service LSAR already provides the capability to automate the data required to produce the individual lists required as part of a Technical manual. In addition, the maintenance procedures narrative is automated. These products are currently provided to the Government as hardcopy. Automation of the information would reduce the time involved in the reformatting of the narrative LSAR data to a TM format. Short term automation opportunities would be directed at automation of the TM/TO development process from LSAR resulting in hardcopy products. Long term automation opportunities would involve automation of the TM/TO product itself as it is used by the soldier in the field.

5. Document Redundancy. As the military standard and specifications cited already cite the LSAR as providing source data, there is little or no duplication between the documents in -2A.

LSAR INTERFACE AREA

SUBJECT: Transportability

1. Interfacing Documents: Non-identified.
2. Interfacing DID's: Non-identified.
3. Interfacing Analysis/Description: MIL-STD-1388-2A data can be used to satisfy all Transportability Engineering characteristics identified by the Military Traffic Management Command (MTMC) for the establishment of transportability requirements.
4. Automation Opportunities: The LSAR Data Record J is currently not automated, however, the LSAR ADP system does provide the capability to automate the transportability information identified on the Data Record.
5. Document Redundancy: Non-identified.

LSAR INTERFACE AREA

SUBJECT: Packaging Requirements

1. Interfacing Documents: MIL-STD-2073-1A, Procedures for Development and Application of Packaging Data. MIL-STD-2073-2A, Packaging Requirements Code.

2. Interfacing DID's: None.

3. Analysis of Interface:

a. MIL-STD-2073-1A identifies the procedures for development of packaging requirements for DoD materiel based on physical/chemical characteristics, fragility, dimensions and weight. It also provides the format to be used for the preparation of packaging data. The packaging data element codes and explanations are contained in MIL-STD-2073-2A.

b. Packaging data are documented on the LSAR data record H of MIL-STD-1388-2A. All packaging data elements identified by MIL-STD-2073-1A/-2A are also contained in MIL-STD-1388-2A. In addition, the Joint Service LSAR ADP system provides an automation system for packaging data.

c. Two DID's were developed for delivery of packaging data using MIL-STD-1388-2A. DI-L-7166, LSA-025, Packaging Requirements Data Report, is in the identical format specified by MIL-STD-2073-1A; DI-L-7167, LSA-026, Packaging Developmental Data Report, provides the essential data to develop packaging requirements data in-house.

4. Automation Opportunities. The Joint Service LSAR ADP system already provides the capability to automate packaging requirements and to deliver this data using the LSA-025 or LSA-026 reports. Further automation may be obtained by delivery of the LSA-025 in a magnetic tape or punched card medium.

5. Document Redundancy. None.

LSAR INTERFACE AREA

Subject: Reliability - Failure Modes, Effect and Criticality
Analysis (FMECA) Reliability Predictions

1. **Interfacing Documents:** MIL-STD-785B, Reliability Program
for Systems and Equipment Develop-
ment and Production
MIL-STD-1629A, Procedures for
Performing a FMECA
MIL-HDBK-217, Reliability Pre-
diction of Electronic Equipment
2. **Interfacing DID's:** DI-R-7085, FMECA Report
DI-R-7082, Reliability Prediction Report
3. **Interface Analysis/Description:**
 - a. MIL-STD-785B identifies the requirement for
accomplishing a FMECA and reliability predictions selectively on
DoD contract definitized procurements, RFP's, SOW's, and
government in-house developments requiring reliability programs
for the development, production and initial deployment of systems
and equipment. Task 203, reliability predictions, is imposed to
estimate the basic system reliability of the end item and to make
a determination of whether these reliability requirements can be
achieved with the proposed design. To accomplish this task
component (item) failure rates must be obtained using the
procedures contained in MIL-HDBK-217 or a procuring activity
approved procedure/data source. Task 04 of MIL-STD-785B
establishes the requirement for conduct of a FMECA in accordance
with MIL-STD-1629A. In turn, MIL-STD-1629A identifies four tasks
as follows:

- (1) Task 101, Failure Modes and Effects Analysis
- (2) Task 102, Criticality Analysis
- (3) Task 103, FMECA Maintainability Analysis
- (4) Task 104, Damage Mode and Effects Analysis.

b. The FMECA tasks result in the generation of data (both narrative and numerical) that are documented on the LSAR data records B1 and B2 of MIL-STD-1388-2A. In addition, the Joint Service LSAR ADP system provides an automation system for the FMECA data (i.e., a FMECA data base). Contained on data record B2 is the data element failure rate which is a necessary data element for estimating the basic and system reliability of the end item. Item reliability values to include end items are documented on the B record. For the electronic components failure rates would be developed using MIL-HDBK-217.

c. The paragraph 2 DID's calls for delivery of hardcopy FMECA worksheets and for a hardcopy Reliability Prediction Report. Each of these DID's could be satisfied by using the data contained in the LSAR data base.

4. Automation Opportunities.

a. The Joint Service LSAR ADP system already provides the capability to automate the FMECA results. As such, DI-R-7085 should be modified to allow delivery of the FMECA data in an automated mode. Such an option would allow defense contractors to develop the FMECA data using in-house automation techniques (i.e., internal failure history files), thereby eliminating the "stubby pencil" requirement currently imposed.

b. Automation of the FMECA data in the LSAR to include failure rates would provide an automated file from which end item basic and mission reliability predictions could be made. This would not eliminate DI-R-7082. However, the analysis effort could be translated into an automated reliability prediction technique used by all defense contractors.

c. To aid defense contractors in the establishment of component failure rates, automation of the MIL-HDBK-217 failure rate data and procedures would provide a file that could be interfaced with the LSAR data file for automatic posting of failure rate information. Once again, this would reduce the analysis effort required (i.e., automation versus manual).

5. Document Redundancy. MIL-STD-1388-2A contains all the data requirements of MIL-STD-1629A. The analysis requirements of MIL-STD-1629A can be included in MIL-STD-785B, thereby eliminating MIL-STD-1629A.

LSAR INTERFACE AREA

SUBJECT: Maintainability--Maintainability Predictions,
Maintainability Analysis

1. **Interfacing Documents:** MIL-STD-470A, Maintainability
Program for Systems Equipment:

MIL-HDBK-472, Maintainability Prediction

MIL-STD-1629A, FMECA

2. **Interfacing DIDs:** DI-R-7108, Maintainability Predictions
Report
DI-R-7109, Maintainability Analysis
Report

3. **Interface Analysis/Description:**

a. Task 203, Maintainability Predictions, and Task 205, Maintainability Analysis contained in MIL-STD-470A, are both oriented toward establishing maintainability parameters (i.e., mean-time-to-repair, maintenance man-hours, levels of repair, fault detection probabilities, etc.) from the hardware design that can then be used to determine whether or not the system maintainability requirements have been met. Task 203 requires the use of MIL-HDBK-472 and the prediction techniques contained in this handbook unless a suitable substitute is approved. At the heart of both tasks are the determination of system, subsystem, assembly and subassembly maintainability parameters for each level of maintenance and, when applicable, alternate maintenance concepts. MIL-HDBK-472 contains four different procedures for accomplishing Task 203 which results in the prediction of corrective and preventive maintenance down-times and man-hours. At the core of these procedures are the use of task elements (i.e., malfunction verification, fault location, part procurement, repair and malfunction test) that are used for apportionment of time. Also interfacing with these tasks is the

MIL-STD-1629A Task 103, FMECA-Maintainability information which specifies the requirement to identify failure detection means and basic maintenance actions required to correct a fault.

b. MIL-STD-1388-2A Data Record B2 contains the same data elements as Task 103 of MIL-STD-1629A. Data Records C, D, and D1 contain the same data elements that would result from Tasks 203 and 205 of MIL-STD-470A. In particular, Data Record D is used to capture the narrative operator and maintenance instructions and the predicted times (both elapsed and man-hours) to accomplish each step of a task. From a maintainability prediction standpoint, the narrative can be as simple as the task elements identified in MIL-HDBK-472 and from a maintainability/maintenance analysis standpoint, the narrative would be detailed enough to support publication development. The amount of detail would be directly relatable to the maturity of the design effort.

c. Data Items DI-R-7108 and DI-R-7109 require delivery of a maintainability prediction report and maintainability analysis report, respectively. Neither data item addresses a specific format nor do they specify the exact data to be delivered. As such, a number of LSAR reports defined in MIL-STD-1388-2A developed from the data elements on Data Records B2, C, D, and D1 could be used to satisfy these report requirements. Candidate LSAR Reports include:

- LSA-003, Maintainability Summary (DI-L-7148)
- LSA-015, Sequential Task Description (DI-L-7159)
- LSA-053, Maintainability Summary - Level of Repair (DI-L-7177)
- LSA-055, Failure Mode Detection Summary (DI-L-7179)
- LSA-060, LSA Control Number Master File (i.e., Data Records B2, C, D, and D1)

4. Automation Opportunities.

The Joint Service LSAR ADP System already provides the capability to automate the maintainability prediction and analysis results as well as the FMECA-maintainability information. To aid in the analysis process, automation

of the MIL-HDBK-472 task elements and perhaps the procedures themselves could significantly reduce the effort required to generate the maintainability predication/analysis data.

5. Document Redundancy. MIL-STD-1629A and MIL-STD-470A contain similar task requirements for maintainability information. Elimination of Task 103 in MIL-STD-1629A would prevent duplication of analysis efforts with MIL-STD-470A. In addition, data items DI-R-7108 and 7109 should either be modified to reference use of the LSAR reports or deleted in their entirety in favor of the LSAR report data items.

LSAR INTERFACE AREA

SUBJECT: Manpower, Personnel and Training

1. Interfacing Documents: MIL-T-81821, Trainers, Maintenance Equipment and Services General Specifications for.
2. Interfacing DID's:
 - DI-H-7057 Human Engineering Design Approach Document Maintainer
 - DI-H-7068 Task and Skill Analysis Report
 - DI-H-7090 Training Path System Documentation
 - DI-H-7091 Personnel Performance Profiles
 - DI-H-3258 Training Support Data
 - DI-H-6135A Reports Facilities - Maintenance Training Equipment
 - DI-H-1300 Personnel and Training Requirements
 - DI-H-7067 Training Course Proposal
 - DI-H-7069 Training Course Curriculum Outline
3. Interfacing Analysis/Description: MIL-STD-1388-2A data can be used to satisfy four of the interfacing DID's completely and provides the majority of data required for the remaining five DID's. The shortfall between the MP&T community and the LSA process resides in the level of narrative detail required. The LSAR can accommodate the bulk of the detail required, however, the LSA requirements generally lack adequate MP&T considerations due to a lack of defined contractual interfaces.

4. Areas for Automation. All of the interfacing DID's in paragraph 2 require delivery in a hardcopy format. LSAR Data Records E, E1, F and G are not presently the FY85 timeframe will provide significant automation opportunities in the MP&T area. Specifically, QQPRI information could be completely automated from the LSAR data base resulting in automated rather than hardcopy delivery. Automation of the basic MP&T data needed to conduct the analysis would greatly aid the contractor's effort. The MP&T data to be automated as a consolidated data base would include a narrative description of all skill's, duties, their training curriculum, and detailed man-hour data for each of the systems the skills are required to maintain. Such a consolidation data base would be provided to the defense contractor as a baseline for the LSA effort of the new system. The resulting LSAR data from the new system would then provide an automated update to the consolidated data base. The last area of automation is in the delivery of the facilities and maintenance training equipment report which can be developed from the LSAR data base. Modification of DI-H-6135A to allow for delivery of this data in an automated mode would be required.

5. Document Redundancy. The MIL-STD-1388-2A does not duplicate the requirements as set forth in the DID's or MIL-T-81821.

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CODES		DATA ELEMENT NAME		DATA ELEMENT NAME		DATA SOURCE		ILS ELEMENT		DOCUMENT INTERFACE		DID INTERFACE		NEUTRAL DATA BASE	
1 - SAME DATA ELEMENT 2 - SIMILAR 3 - GENERALLY THE SAME BUT DIFFERENT 4 - DIFFERENT		D - CAN BE DERIVED FROM DATA BASE C - CANDIDATE FOR NEUTRAL FILE B - CANDIDATE FOR INTERFERENCE ELEMENT		PART I		PART II		ILS ELEMENT		DOCUMENT INTERFACE		DID INTERFACE		NEUTRAL DATA BASE	
CARD NUMBER	DATA ELEMENT NUMBER	DATA ELEMENT NAME		DATA ELEMENT NAME		DATA SOURCE		ILS ELEMENT		DOCUMENT INTERFACE		DID INTERFACE		NEUTRAL DATA BASE	
LSAR DATA RECORD J (CONT'D)															
1-1	1-1	LIFTING PROVISIONS				ILSP									
1-2	1-2	CARD SEQUENCING CODE				CONTRACTOR									
1-3	1-3	REMARKS/OPTIONS													
PACKAGING DATA															
2-1	2-1	PACKAGING CATEGORY CODE				CONTRACTOR									
2-2	2-2	METHOD OF PRESERVATION				CONTRACTOR									
2-3	2-3	CLEANING AND TYING PROCEDURE				CONTRACTOR									
2-4	2-4	PRESERVATION MATERIAL CODE				CONTRACTOR									
2-5	2-5	WRAPPING MATERIAL CODE				CONTRACTOR									
2-6	2-6	CUSHIONING AND SPACING MATERIAL CODE				CONTRACTOR									
2-7	2-7	CUSHIONING THICKNESS CODE				CONTRACTOR									
2-8	2-8	UNIT CONTAINER CODE				CONTRACTOR									
2-9	2-9	INTERMEDIATE CONTAINER QUANTITY				CONTRACTOR									
2-10	2-10	DEGREE OF PROTECTION CODE				CONTRACTOR									
2-11	2-11	SPECIAL NAMING CODE				CONTRACTOR									
2-12	2-12	UNIT PAGE WEIGHT				CONTRACTOR									
2-13	2-13	UNIT PAGE SIZE				CONTRACTOR									
2-14	2-14	SPECIAL PACKAGING INSTRUCTION NUMBER				CONTRACTOR									
2-15	2-15	SPECIAL PACKAGING INSTRUCTION NUMBER REVISION				CONTRACTOR									
2-16	2-16	PACKAGING CODE				CONTRACTOR									
2-17	2-17	SPECIAL CODE				CONTRACTOR									
2-18	2-18	UNIT CONTAINER LEVEL				CONTRACTOR									
2-19	2-19	OPTIONAL NATIONAL STOCK NUMBER				CONTRACTOR									
2-20	2-20	OPTIONAL PROCEDURES INDICATOR				CONTRACTOR									
2-21	2-21	UNIT SIZE				CONTRACTOR									
2-22	2-22	UNIT WEIGHT				CONTRACTOR									
2-23	2-23	FEDERAL SUPPLY CODE FOR MANUFACTURERS				CONTRACTOR									
2-24	2-24	SUPPLEMENTAL PACKAGING DATA				CONTRACTOR									
2-25	2-25	SUPPLEMENTAL PACKAGING DATA OVERFLOW				CONTRACTOR									

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CODES		D - CAN BE DERIVED FROM DATA BASE		D - CANDIDATE FOR NEUTRAL FILE		DID INTERFACE		DOCUMENT INTERFACE		ILS ELEMENT		NEUTRAL DATA BASE	
A - SAME DATA ELEMENT		S - SIMILAR		G - GENERALLY THE SAME BUT DIFFERENT INTERFACES		DID INTERFACE		DOCUMENT INTERFACE		ILS ELEMENT		NEUTRAL DATA BASE	
CARD NUMBER	PART I	DATA ELEMENT NAME	DATA SOURCE	MAINT. PLAN	TECHNICAL DATA	PHYSICAL DATA	PHYSICAL DATA	PHYSICAL DATA	PHYSICAL DATA	PHYSICAL DATA	PHYSICAL DATA	PHYSICAL DATA	PHYSICAL DATA
00-1		LSAR DATA RECORD F (CONT'D)											
00-2		CAMP SCHEDULE CODE	-2A										
00-3		FACILITIES DESIG CRITERIA	PM/FAC DES. ENG.										
00-4		CAMP SCHEDULE CODE -	-2A										
00-5		FACILITIES INSTALLATION LEAD TIME	ILSP										
00-6		CAMP SCHEDULE CODE	-2A										
00-7		TYPE OF CONSTRUCTION	PAC DES. ENG.										
00-8		CAMP SCHEDULE CODE	-2A										
00-9		UTILITIES REQUIREMENTS	PM/SSP/FAC ENG										
00-10		CAMP SCHEDULE CODE	-2A										
00-11		FACILITIES UTILIZATION	ILSP/MAINT PLAN										
00-12		CAMP SCHEDULE CODE	-2A										
00-13		FACILITY MAINT COST RATIOABLE	PAC ENG.										
00-14		CAMP SCHEDULE CODE	-2A										
00-15		UTILIZATION	ILSP/PM/CONT.										
00-16		LSAR DATA RECORD G											
00-17		LOGISTIC SUPPORT ANALYSIS CONTROL NUMBER (Applies to complete 6 record)	LSAP										
00-18		ALTERNATE LSA CONTROL NUMBER CODE (Applies to complete 6 record 61, 62, 63)	-2A										
00-19		SPECIAL SPECIALTY CODE ASSIGNED AND BUT POSITION	ILSP/SSP										
00-20		EXP. LTD. ASSIGNED CODE	A01 CARD										
00-21		SERVICE DESIGNATION CODE	A01 CARD										
00-22		FEDERAL SUPPLY CODE FOR MANUFACTURE	A01 CARD										
00-23		MAINT. CLASSIFICATION	A01 CARD										
00-24		SERIAL NUMBER EFFECTIVITY	A01 CARD										
00-25		SPECIAL CODE (Applies to complete 6 record)	-2A										
00-26		SPECIAL SPECIALTY CODE ASSIGNED AND BUT POSITION	TQOPRI/NETP										
00-27		BUT POSITION EFFECTIVITY, A SER OR REVISOR SER	TQOPRI/NETP										
00-28		SPECIAL SPECIALTY CODE ASSIGNED AND BUT POSITION	TQOPRI/NETP										
00-29		TEST CODE	TQOPRI/NETP										
00-30		SECURITY CLEARANCE	TQOPRI/NETP										
00-31		RECOMMENDED NAME/INIT/CRASH	ILSP/TQOPRI/NETP										
00-32		SPECIAL SPECIALTY CODE ASSIGNED AND BUT POSITION	G01 CARD										
00-33		CAMP SCHEDULE CODE	-2A										
00-34		LOGISTIC SUPPORT ANALYSIS CONTROL NUMBER	C06/D02 CARDS										
00-35		ALTERNATE LSA CONTROL NUMBER CODE	C06/D02 CARDS										
00-36		NAME CODE	G01 CARD										
00-37		SPECIAL SPECIALTY CODE ASSIGNED AND BUT POSITION	-2A										
00-38		ADDITIONAL SERIAL REQUIREMENT - SERIAL REQUIREMENT A SER OR REVISOR CODE	CONT/NETP										
00-39		SPECIAL SPECIALTY CODE ASSIGNED AND BUT POSITION	G01 CARD										
00-40		CAMP SCHEDULE CODE	-2A										
00-41		PHYSICAL AND SERIAL REQUIREMENT	TQOPRI/NETP										

CODES			D - CAN BE DERIVED FROM DATA BASE		D - CANDIDATE FOR NEUTRAL FILE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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1 - SAME DATA ELEMENT 2 - CANDIDATE FOR NEUTRAL FILE 3 - GENERALLY THE SAME BUT DIFFERENT - INTERFERENCE ELEMENT			D - CAN BE DERIVED FROM DATA BASE C - CANDIDATE FOR NEUTRAL FILE B - GENERALLY THE SAME BUT DIFFERENT - INTERFERENCE ELEMENT		DATA SOURCE		ILS ELEMENT										DOCUMENT INTERFACE	DID INTERFACE	INTERFERENCE	NEUTRAL DATA BASE
NO.	PART I	PART II	LSAR DATA RECORD E (CONT'D)		DATA SOURCE		ILS ELEMENT										DOCUMENT INTERFACE	DID INTERFACE	INTERFERENCE	NEUTRAL DATA BASE
NO.	PART I	PART II	LSAR DATA RECORD E (CONT'D)		DATA SOURCE		ILS ELEMENT										DOCUMENT INTERFACE	DID INTERFACE	INTERFERENCE	NEUTRAL DATA BASE
00-1			SPECIFIC AUTHORIZATION		SSP															
00-2			TOTAL QUANTITY		SSP															
00-3			MILL SPECIALTY CODE		SSP															
00-4			OPERATOR'S MANUAL		SSP/CONTRACTOR															
00-5			CARD SCHEDULING CODE		-2A															
10-1			FUNCTIONS TO BE PERFORMED, C AND D RECORDS		COG/DO2 CARDS															
10-2			CARD SCHEDULING CODE		-2A															
10-3			PARAMETERS RELATED		SSP/CONTRACTOR															
10-4			ADAPTER/INTERCONNECTION DEVICE NUMBER		SSP/CONTRACTOR															
10-5			SESSIONS ON TRANSMISSION		SSP/CONTRACTOR															
10-6			INPUT POWER SOURCE		SSP/CONTRACTOR															
10-7			CARD SCHEDULING CODE		-2A															
10-8			ADAPTER/INTERCONNECTION DEVICE(S)		SSP/CONTRACTOR															
10-9			CARD SCHEDULING CODE		-2A															
10-10			ATTENDING TEST PROGRAM		SSP/CONTRACTOR															
10-11			CARD SCHEDULING CODE		-2A															
10-12			TEST PROGRAM INSTRUCTION		SSP/CONTRACTOR															
10-13			CARD SCHEDULING CODE		-2A															
10-14			INSTALLATION FACTORS OR OTHER FACILITIES		SSP/CONTRACTOR															
10-15			CARD SCHEDULING CODE		-2A															
10-16			SPECIFICATION, CHARACTERISTICS, DESCRIPTION AND FUNCTION		SSP/CONTRACTOR															
10-17			CARD SCHEDULING CODE		-2A															
10-18			ADDITIONAL SKILLS AND SPECIAL TRAINING REQUIREMENTS		SSP/CONTRACTOR															
10-19			CARD SCHEDULING CODE		-2A															
10-20			JUSTIFICATION		SSP/CONTRACTOR															
10-21			CARD SCHEDULING CODE		-2A															
10-22			CARD SCHEDULING CODE		-2A															
10-23			CARD SCHEDULING CODE		-2A															
10-24			EXPLANATION		CONTRACTOR															
10-25			LUCRATIC SUPPORT ANALYSIS CONTROL NUMBER		C RECORD															
10-26			ALTERNATE LIA CONTROL NUMBER CODE		C RECORD															
10-27			ITEM NAME		CO3 CARD															
10-28			MANUFACTURER'S PART NUMBER		CO4 CARD															
10-29			TEST INSTRUMENTS FACTORY NUMBER		CO4 CARD															
10-30			CONTROLLER FACTOR		MIL-STD 1519															
10-31			MANUFACTURER'S PART NUMBER SPECIFICATION		CO3 CARD															
10-32			PARAMETERS TO BE RELAYED		CO5 CARD															
10-33			STANDARD FOR OPERATION		MILSP/SSP/PM															
10-34			COORDINATED TEST PLAN		MILSP/SSP/PM															
10-35			TECHNICAL DATA PACKAGE		CONTRACTOR/PM															

CODES		D - CAN BE DERIVED FROM DATA BASE E - CANDIDATE FOR NEUTRAL FILE S - GENERALLY THE SAME BUT DIFFERENT INTERFACES	
CANDIDATE NUMBER	PART I	DATA ELEMENT NAME	DATA SOURCE
LSAR DATA RECORD E (CONT'D)			
001		DRAWING	
002		PM/FED CAT	
003		SSP	
004		SSP	
005		SSP	
006		CONTRACTOR	
007		CONTRACTOR	
008		CONTRACTOR	
009		SSP	
010		SSP	
011		CONTRACTOR	
012		DOD 4100.30M	
013		CONTRACTOR	
014		PM/CONTRACTOR	
015		PM/CONTRACTOR	
016		CONTRACTOR	
017		DOD 4100.30M	
018		PM	
019		PM/CONTRACTOR	
020		CONTRACTOR/SSP	
021		CONTRACTOR/SSP	
022		CONTRACTOR/SSP	
023		CONTRACTOR	
024		CONTRACTOR	
025		PM/SSP	
026		-2A CONTRACTOR	
027		CONTRACTOR/SSP	
028		CONTRACTOR/SSP	
029		PM	
030		CONTRACTOR	
031		-2A CONTRACTOR	
032		CONTRACTOR	
033		EDB/ED9 CARDS	
034		PM/CONTRACTOR	
035		CONTRACTOR/SSP	
036		CONTRACTOR/SSP	
037		CONTRACTOR/SSP	
038		-2A	
039		ILSP SSP	

CODES			D - CAN BE DERIVED FROM DATA BASE E - CANDIDATE FOR NEUTRAL FILE G - GENERALLY THE SAME BUT DIFFERENT - INTERFERENCE ELEMENT		DATA SOURCE		ILS ELEMENT										DOCUMENT INTERFACE	DIS INTERFACE	NEUTRAL DATA BASE
CAN NUMBER	PART I	DATA ELEMENT NAME	DATA SOURCE	ILS ELEMENT	DOCUMENT INTERFACE	DIS INTERFACE	NEUTRAL DATA BASE												
00-70		PERFORMANCE STANDARDS	MTA																
00-71		TRAINING REQUIREMENTS	MTA																
00-72		TRAINING MATERIALS	MTA																
00-73		TRAINING LOCATION MATERIALS	MTA																
00-74		TRAINING CRITICALITY	MTA																
00-75		TASK CODE	DO6 CARD																
00-76		SUPPORT ITC SOURCE CODE	IL-STD 1388-2																
00-77		REFERENCE NUMBER	FED SUP CAT/CTR																
00-78		SIGNIFICANT CHARACTER CODE	IL-STD 1388-2																
00-79		ITEM CATEGORY CODE	-2A CONTRACTOR																
00-80		ITEM NAME	H6-1																
00-81		QUANTITY PER TASK	DO2 CARD																
00-82		UNIT OF MEASURE	4100.38-M																
00-83		ADDRESS CRITICAL ITEM	MTA																
00-84		LOGISTIC SUPPORT ANALYSIS CODES (applies to supplies & services)	CONTRACTOR																
00-85		ALTERNATE LSA CODES (applies to supplies & services)	IL-STD 1388-2																
00-86		END ITEM AGENCY CODE	PM																
00-87		FEDERAL SUPPLY CODE FOR MANUFACTURERS	HL-1/HL-2																
00-88		BRANDED CLASSIFICATION	DOO-D-1000																
00-89		SERIAL NUMBER EFFICIENCY	CONTRACTOR																
00-90		SERVICE DESIGNATION CODE	PM/ROC																
00-91		SUPPORT EQUIPMENT RECOMMENDATION DATA NUMBER	PM																
00-92		SUPPORT EQUIPMENT RECOMMENDATION DATA NUMBER	PM																
00-93		CONTRACTOR PROVIDED EQUIPMENT/CONTRACTOR PROVIDED EQUIPMENT	PM																
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CODES		1 - SAME DATA ELEMENT 2 - CAN BE DERIVED FROM DATA BASE 3 - SIMILAR 4 - CANDIDATE FOR NEUTRAL FILE 5 - GENERALLY THE SAME BUT DIFFERENT - INTERFERENCE ELEMENT		DATA ELEMENT NAME		DATA SOURCE		ILS ELEMENT										DOCUMENT INTERFERENCE		DID INTERFERENCE		NEUTRAL DATA BASE	
LSAR CARD NO.	LSAR CARD NO.	DATA ELEMENT NAME	DATA SOURCE	MAINT. PLAN	TRAINING	TECHNICAL DATA	TRAINING AND SERVICES	TECHNICAL DATA	TRAINING AND SERVICES	TECHNICAL DATA	TRAINING AND SERVICES	TECHNICAL DATA	TRAINING AND SERVICES	TECHNICAL DATA	TRAINING AND SERVICES	TECHNICAL DATA	TRAINING AND SERVICES	TECHNICAL DATA	TRAINING AND SERVICES	TECHNICAL DATA	TRAINING AND SERVICES	TECHNICAL DATA	TRAINING AND SERVICES
00-1	00-1	TASK ELEMENT	MTA																				
00-2	00-2	TRAINING BASE	PMF/ROC																				
00-3	00-3	TASK IDENTIFICATION	PMF/ROC																				
00-4	00-4	TASK IDENTIFICATION CODE	COMPUTER GEN.																				
00-5	00-5	TASK IDENTIFICATION FOR	PM																				
00-6	00-6	FACILITIES REQUIREMENTS CODE	MTA																				
00-7	00-7	TRAINING EQUIPMENT REQUIREMENTS CODE	MTA																				
00-8	00-8	TRAINING EQUIPMENT REQUIREMENTS CODE	MTA																				
00-9	00-9	MEANS OF DETECTION	MTA																				
00-10	00-10	HAZARDOUS MAINTENANCE PROCEDURES CODE	MTA																				
00-11	00-11	HAZARDOUS MAINTENANCE PROCEDURES CODE	MTA																				
00-12	00-12	TECHNICAL MANUAL	TN/TD																				
00-13	00-13	LSAR DATA RECORD D	LSA PLAN																				
00-14	00-14	LOGISTIC SUPPORT ANALYSIS CONTROL NUMBER (Applies to complete D Record record 002)	MTA																				
00-15	00-15	ALTERNATE LSA CONTROL NUMBER CODE (Applies to complete D Record as needed record 002)	MTA																				
00-16	00-16	TASK CODE	MTA																				
00-17	00-17	TASK IDENTIFICATION CODE	LSA-107																				
00-18	00-18	UPDATE CODE (Applies to D and O Records)	CO6 CARD																				
00-19	00-19	TASK IDENTIFICATION CODE	DOI CARD																				
00-20	00-20	SEQUENCE LINE NUMBER	ALL STD 1388-20																				
00-21	00-21	SEQUENCE LINE NUMBER	ALL STD 1388-20																				
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00-63	00-63	SEQUENCE LINE NUMBER	MTA																				
00-64	00-64	SEQUENCE LINE NUMBER	MTA																				
00-65	00-65	SEQUENCE LINE NUMBER	MTA																				
00-66	00-66	SEQUENCE LINE NUMBER	MTA																				
00-67	00-67	SEQUENCE LINE NUMBER	MTA																				
00-68	00-68	SEQUENCE LINE NUMBER	MTA																				
00-69	00-69	SEQUENCE LINE NUMBER	MTA																				
00-70	00-70	SEQUENCE LINE NUMBER	MTA																				

A-42

CODES		DATA ELEMENT NAME		D - CAN BE DERIVED FROM DATA BASE	
1 - SAME DATA ELEMENT				C - CANDIDATE FOR NEUTRAL FILE	
2 - SIMILAR				I - INTERFACES ELEMENT	
3 - GENERALLY THE SAME BUT DIFFERENT					
CAN CODE NUMBER	PART I	DATA ELEMENT NAME		DATA SOURCE	
		LSAR DATA RECORD B (CONT'D)			
10-1	051	CARD SEQUENCING CODE		ILS PLAN	
10-2	052	MAINTENANCE CONCEPT		PMECA	
10-3	110	FAILURE MODE INDICATOR		ROM	
10-4	051	CARD SEQUENCING CODE		ROM	
10-5	333	PREVENTIVE MAINTENANCE		ROM	
10-6	333	RELIABILITY CENTERED MAINTENANCE LOGIC RESULTS			
10-7	052	DISPOSITION			
10-8	052	LOGISTIC SUPPORT ANALYSIS CONTROL NUMBER			
10-9	052	ALTERNATE LSA CONTROL NUMBER CODE			
10-10	487	TASK CODE			
10-11	487	TASK TIME			
10-12	154	LOGIC SYMBOL			
10-13	129	FAILURE MODE INDICATOR			
10-14	051	CARD SEQUENCING CODE			
10-15	444	SYSTEM EFFECTS: RECONFIGURATION, DISPOSITION, RESULTS, REMARKS			
10-16	154	LOGISTIC SUPPORT ANALYSIS CONTROL NUMBER			
10-17	052	ALTERNATE LSA CONTROL NUMBER CODE (Applies to complete B1 Record)			
10-18	129	FAILURE MODE INDICATOR			
10-19	051	CARD SEQUENCING CODE			
10-20	129	FAILURE MODE CODE			
10-21	129	FAILURE MODE AND CAUSE/PANACE CODE			
10-22	231	MISSION PHASE CODE			
10-23	129	FAILURE MODE CODE			
10-24	129	MISSION PHASE/OPERATIONAL NOTE			
10-25	129	FAILURE PROBABILITY LEVEL			
10-26	129	SWIFT MALFUNCTION INDICATOR CODE			
10-27	051	CARD SEQUENCING CODE			
10-28	129	FAILURE MODE INDICATOR			
10-29	129	FAILURE EFFECT CODE			
10-30	129	FAILURE/DAMAGE EFFECTS: LOCAL, NEXT HIGHER, LAMB EFFECT			
10-31	129	FAILURE MODE INDICATOR			
10-32	051	CARD SEQUENCING CODE			
10-33	129	FAILURE MODE CODE			
10-34	129	FAILURE MODE AND CAUSE/PANACE CODE			
10-35	129	MISSION PHASE CODE			
10-36	129	FAILURE PROBABILITY LEVEL			
10-37	051	CARD SEQUENCING CODE			
10-38	129	FAILURE MODE INDICATOR			
10-39	129	FAILURE EFFECT CODE			
10-40	129	FAILURE/DAMAGE EFFECTS: LOCAL, NEXT HIGHER, LAMB EFFECT			
10-41	129	FAILURE MODE INDICATOR			
10-42	051	CARD SEQUENCING CODE			
10-43	129	FAILURE MODE CODE			
10-44	129	FAILURE MODE AND CAUSE/PANACE CODE			
10-45	129	MISSION PHASE CODE			
10-46	129	FAILURE PROBABILITY LEVEL			
10-47	051	CARD SEQUENCING CODE			
10-48	129	FAILURE MODE INDICATOR			
10-49	129	FAILURE EFFECT CODE			
10-50	129	FAILURE/DAMAGE EFFECTS: LOCAL, NEXT HIGHER, LAMB EFFECT			
10-51	129	FAILURE MODE INDICATOR			
10-52	051	CARD SEQUENCING CODE			
10-53	129	FAILURE MODE CODE			
10-54	129	FAILURE MODE AND CAUSE/PANACE CODE			
10-55	129	MISSION PHASE CODE			
10-56	129	FAILURE PROBABILITY LEVEL			
10-57	051	CARD SEQUENCING CODE			
10-58	129	FAILURE MODE INDICATOR			
10-59	129	FAILURE EFFECT CODE			
10-60	129	FAILURE/DAMAGE EFFECTS: LOCAL, NEXT HIGHER, LAMB EFFECT			
10-61	129	FAILURE MODE INDICATOR			
10-62	051	CARD SEQUENCING CODE			
10-63	129	FAILURE MODE CODE			
10-64	129	FAILURE MODE AND CAUSE/PANACE CODE			
10-65	129	MISSION PHASE CODE			
10-66	129	FAILURE PROBABILITY LEVEL			
10-67	051	CARD SEQUENCING CODE			
10-68	129	FAILURE MODE INDICATOR			
10-69	129	FAILURE EFFECT CODE			
10-70	129	FAILURE/DAMAGE EFFECTS: LOCAL, NEXT HIGHER, LAMB EFFECT			
10-71	129	FAILURE MODE INDICATOR			
10-72	051	CARD SEQUENCING CODE			
10-73	129	FAILURE MODE CODE			
10-74	129	FAILURE MODE AND CAUSE/PANACE CODE			
10-75	129	MISSION PHASE CODE			
10-76	129	FAILURE PROBABILITY LEVEL			
10-77	051	CARD SEQUENCING CODE			
10-78	129	FAILURE MODE INDICATOR			
10-79	129	FAILURE EFFECT CODE			
10-80	129	FAILURE/DAMAGE EFFECTS: LOCAL, NEXT HIGHER, LAMB EFFECT			
10-81	129	FAILURE MODE INDICATOR			
10-82	051	CARD SEQUENCING CODE			
10-83	129	FAILURE MODE CODE			
10-84	129	FAILURE MODE AND CAUSE/PANACE CODE			
10-85	129	MISSION PHASE CODE			
10-86	129	FAILURE PROBABILITY LEVEL			
10-87	051	CARD SEQUENCING CODE			
10-88	129	FAILURE MODE INDICATOR			
10-89	129	FAILURE EFFECT CODE			
10-90	129	FAILURE/DAMAGE EFFECTS: LOCAL, NEXT HIGHER, LAMB EFFECT			

CODES		D - CAN BE DERIVED FROM DATA BASE		DATA SOURCE		ILS ELEMENT										DOCUMENT INTERFACE	DID INTERFACE	INTERFERENCE	NEUTRAL DATA BASE	
1 - SAME DATA ELEMENT		E - CANDIDATE FOR NEUTRAL FILE		DATA SOURCE		ILS ELEMENT										DOCUMENT INTERFACE	DID INTERFACE	INTERFERENCE	NEUTRAL DATA BASE	
2 - SIMILAR		F - INTERFERENCE ELEMENT		DATA SOURCE		ILS ELEMENT										DOCUMENT INTERFACE	DID INTERFACE	INTERFERENCE	NEUTRAL DATA BASE	
3 - GENERALLY THE SAME BUT DIFFERENT		F - INTERFERENCE ELEMENT		DATA SOURCE		ILS ELEMENT										DOCUMENT INTERFACE	DID INTERFACE	INTERFERENCE	NEUTRAL DATA BASE	
CARD NUMBER	NO. AND	PART I	DATA ELEMENT NAME	DATA SOURCE	ILS ELEMENT	MAINT. PLAN	PERFORMANCE	SUPPORT EQUIP.	TECHNICAL DATA	TRAINING AND	COMPARISON	FAULTS	PHS	TRANSPORTATION	DESIGN INTERFACES	LSA/LSAR	DOCUMENT INTERFACE	DID INTERFACE	INTERFERENCE	NEUTRAL DATA BASE
0-4	110		FEDERAL SPECIAL CODE FOR MAINTENANCE	HL-1																
0-7	3-3		NON-TECHNICAL MAINTENANCE CODE	HL-1																
0-1	216		MANUFACTURER'S PART NUMBER	HL-1																
0-2	100		ISSUING NUMBER	HL-1																
0-3	193		LOGISTIC CONTINGENCY	HL-1																
0-4	040		BUILT IN TEST APPLICATION	HL-1																
0-5	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-6	040		FAULT ISOLATION	HL-1																
0-7	040		BUILT IN TEST APPLICATION	HL-1																
0-8	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-9	040		FAULT ISOLATION	HL-1																
0-10	040		BUILT IN TEST APPLICATION	HL-1																
0-11	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-12	040		FAULT ISOLATION	HL-1																
0-13	040		BUILT IN TEST APPLICATION	HL-1																
0-14	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-15	040		FAULT ISOLATION	HL-1																
0-16	040		BUILT IN TEST APPLICATION	HL-1																
0-17	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-18	040		FAULT ISOLATION	HL-1																
0-19	040		BUILT IN TEST APPLICATION	HL-1																
0-20	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-21	040		FAULT ISOLATION	HL-1																
0-22	040		BUILT IN TEST APPLICATION	HL-1																
0-23	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-24	040		FAULT ISOLATION	HL-1																
0-25	040		BUILT IN TEST APPLICATION	HL-1																
0-26	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-27	040		FAULT ISOLATION	HL-1																
0-28	040		BUILT IN TEST APPLICATION	HL-1																
0-29	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-30	040		FAULT ISOLATION	HL-1																
0-31	040		BUILT IN TEST APPLICATION	HL-1																
0-32	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-33	040		FAULT ISOLATION	HL-1																
0-34	040		BUILT IN TEST APPLICATION	HL-1																
0-35	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-36	040		FAULT ISOLATION	HL-1																
0-37	040		BUILT IN TEST APPLICATION	HL-1																
0-38	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-39	040		FAULT ISOLATION	HL-1																
0-40	040		BUILT IN TEST APPLICATION	HL-1																
0-41	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-42	040		FAULT ISOLATION	HL-1																
0-43	040		BUILT IN TEST APPLICATION	HL-1																
0-44	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-45	040		FAULT ISOLATION	HL-1																
0-46	040		BUILT IN TEST APPLICATION	HL-1																
0-47	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-48	040		FAULT ISOLATION	HL-1																
0-49	040		BUILT IN TEST APPLICATION	HL-1																
0-50	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-51	040		FAULT ISOLATION	HL-1																
0-52	040		BUILT IN TEST APPLICATION	HL-1																
0-53	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-54	040		FAULT ISOLATION	HL-1																
0-55	040		BUILT IN TEST APPLICATION	HL-1																
0-56	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-57	040		FAULT ISOLATION	HL-1																
0-58	040		BUILT IN TEST APPLICATION	HL-1																
0-59	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-60	040		FAULT ISOLATION	HL-1																
0-61	040		BUILT IN TEST APPLICATION	HL-1																
0-62	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-63	040		FAULT ISOLATION	HL-1																
0-64	040		BUILT IN TEST APPLICATION	HL-1																
0-65	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-66	040		FAULT ISOLATION	HL-1																
0-67	040		BUILT IN TEST APPLICATION	HL-1																
0-68	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-69	040		FAULT ISOLATION	HL-1																
0-70	040		BUILT IN TEST APPLICATION	HL-1																
0-71	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-72	040		FAULT ISOLATION	HL-1																
0-73	040		BUILT IN TEST APPLICATION	HL-1																
0-74	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-75	040		FAULT ISOLATION	HL-1																
0-76	040		BUILT IN TEST APPLICATION	HL-1																
0-77	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-78	040		FAULT ISOLATION	HL-1																
0-79	040		BUILT IN TEST APPLICATION	HL-1																
0-80	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-81	040		FAULT ISOLATION	HL-1																
0-82	040		BUILT IN TEST APPLICATION	HL-1																
0-83	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-84	040		FAULT ISOLATION	HL-1																
0-85	040		BUILT IN TEST APPLICATION	HL-1																
0-86	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-87	040		FAULT ISOLATION	HL-1																
0-88	040		BUILT IN TEST APPLICATION	HL-1																
0-89	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-90	040		FAULT ISOLATION	HL-1																
0-91	040		BUILT IN TEST APPLICATION	HL-1																
0-92	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-93	040		FAULT ISOLATION	HL-1																
0-94	040		BUILT IN TEST APPLICATION	HL-1																
0-95	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-96	040		FAULT ISOLATION	HL-1																
0-97	040		BUILT IN TEST APPLICATION	HL-1																
0-98	040		DETECTABILITY LEVEL PERCENTAGE	HL-1																
0-99	040		FAULT ISOLATION	HL-1																

CODES		D - CAN BE DERIVED FROM DATA BASE		C - CANDIDATE FOR NEUTRAL FILE		B - GENERALLY THE SAME BUT DIFFERENT - INTERFERENCE ELEMENT								
LSAR CARD NO.	DATA ELEMENT NAME	DATA SOURCE	MAINT. PLAN	REQUIREMENT	SOFTWARE SUPPORT	TECHNICAL DATA	DESIGN AND CONSTRUCTION	PHS	ENVIRONMENTAL	DESIGN INFORMATION	LSAR/LSAR	DOCUMENT INTERFERENCE	D/D INTERFERENCE	NEUTRAL DATA BASE
10-88	101	MEAN MAN-HOURS	PMP/ROC											
10-89	102	RELATIVE INSPECTION	PMP/ROC											
10-90	103	MEAN ELAPSED TIME	PMP/ROC											
10-91	104	MEAN MAN-HOURS	PMP/ROC											
10-92	105	MISSION PROFILE CHANGE	PMP/ROC											
10-93	106	MEAN ELAPSED TIME	PMP/ROC											
10-94	107	MEAN MAN-HOURS	PMP/ROC											
10-95	108	CARD SEQUENCING CODE	PMP/ROC											
10-96	109	OPERATIONS/MAINTENANCE LEVEL	PMP/ROC											
10-97	110	SERVICE DESIGNATOR CODE	PMP/ROC											
10-98	111	SKILL SPECIALTY CODE	PMP/ROC											
10-99	112	SKILL LEVEL CODE	PMP/ROC											
11-00	113	QUANTITY SKILL SPECIALTY CODE AVAILABLE	TRADOC											
11-01	114	MAN-HOURS	TRADOC											
11-02	115	CARD SEQUENCING CODE	H6-1											
11-03	116	ITEM NAME	PMP/ROC											
11-04	117	ITEM TYPE	H6-1											
11-05	118	NATIONAL STOCK NUMBER/REFERENCE NUMBER	PMP/ROC											
11-06	119	FEDERAL SUPPLY CODE FOR MANUFACTURERS	H4-1											
11-07	120	CARD SEQUENCING CODE	PMP/ROC											
11-08	121	ADDITIONAL SPECIFICATIONS/REQUIREMENTS	LSA PLAN											
11-09	122	LOGISTIC SUPPORT ANALYSIS CONTROL NUMBER (Applied to Complete B Record)	LOA											
11-10	123	ALTERNATE LSA CONTROL NUMBER CODE (Applied to Complete B Record as needed)	PMP/ROC											
11-11	124	FEDERAL SUPPLY CODE FOR MANUFACTURERS	H4-1											
11-12	125	SERVICE DESIGNATOR CODE	DOD-D-1000											
11-13	126	FEDERAL SUPPLY CODE FOR MANUFACTURERS												
11-14	127	BRANCH CLASSIFICATION												
11-15	128	SERIAL NUMBER EFFECTIVITY												
11-16	129	USABLE ON CODE												
11-17	130	OPTION 1												
11-18	131	OPTION 2												
11-19	132	OPTION 3												
11-20	133	EPHATE CODE (Applied to complete B, B1 and B2 Records)	1388-2A											
11-21	134	USABLE ON CODE												
11-22	135	ITEM NAME	LOA											
11-23	136	ITEM DESIGNATION CODE	H6-1/AIL-STD-88											
11-24	137	CONVERSION FACTOR	CONTRACTOR											
11-25	138	MANUFACTURER'S PART NUMBER	H4-1											
11-26	139	FEDERAL SUPPLY CODE FOR MANUFACTURERS												
11-27	140	BRANCH NUMBER	DRAWING											

[illegible]

Appendix B

REPORTING REQUIREMENTS UNDER CURRENT MIL STDS

TASK: Identify current MIL-STDs which generate significant reporting requirements (such as MIL-STD 1388-2A, MIL-STD 965, etc.)

LIMITATIONS: There is no centralized recordkeeping of either data requirements imposed contractually or the application of MIL-STD on contracts. As a result, there is no mechanism to differentiate the "popular" from the seldom used, other than to review the subject matter and/or limited coordination status. Time constraints prevented review of the scope and breadth of each MIL-STD, and thus the analysis has been, by and large, an uncritical acceptance of coordinated documents as relevant and significant in this analysis. In similar fashion, there is no recordkeeping of the use of Data Item Descriptions contractually, I have arbitrarily discounted UDI-data items as being developed and applied in limited circumstances, and not of broad or general application. They can, of course, be used (provided they are listed in the AMSDL) by anyone, just as anyone can impose a limited coordinated MIL-STD.

It is also impossible to establish the amount or burden of recordkeeping imposed by a MIL-STD by counting the number of DIDs referenced against the standard.

ANALYSIS: The DoDISS was manually reviewed in the Standardization Areas, which are procedurally-oriented, not hardware-oriented, for fully-coordinated MIL-STDs that appeared to have broad application in a cursory review of their title. Having identified the standards, an attempt was made to group the standards into logically related areas. The Standardization Area assignments served as a starting point for this grouping, but as can be seen, considerable liberty was taken in regrouping and rationalizing associations. As an example, MIL-STD-789 and MIL-STD-885 were grouped with Drawing Practices documents based on similarity of data requirements. This logical grouping needs further work, perhaps on a "committee" basis to tap the expertise and familiarities of a wide variety of functional areas.

RECOMMENDATION: A brief, cursory analysis was done on the CMAN, or Configuration Management discipline. The review was to develop and/or confirm the criteria for ranking the suitability of MIL-STDs to the development of an integrated, disciplined, and structured standard or related family of standards.

The criteria proposed by this writer are listed below, and the committee is free to evaluate the facility and effectiveness of the approach. Several contractors have "automated AMSDLs," which were not available during this analysis. Grouping and analysis of data requirements and taskings would be much simplified by accessing their data bases.

CRITERIA:

1. Evaluate documents, or groups of documents that relate to specific areas, to establish whether there is recognizable program structure. This structure should be adaptable and tailorable to any commodity or system complexity. this formalized structure would be evidenced by:

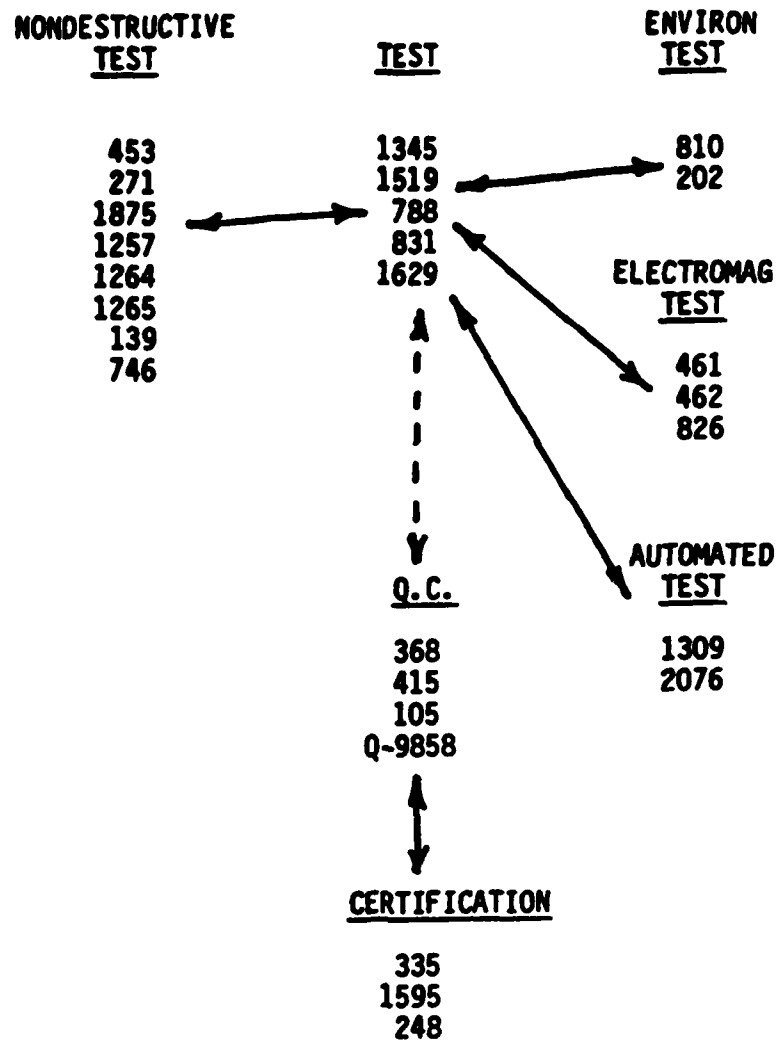
- a. Formal planning documents
- b. Reports and analyses used at fixed milestones for decision
- c. Formal milestones

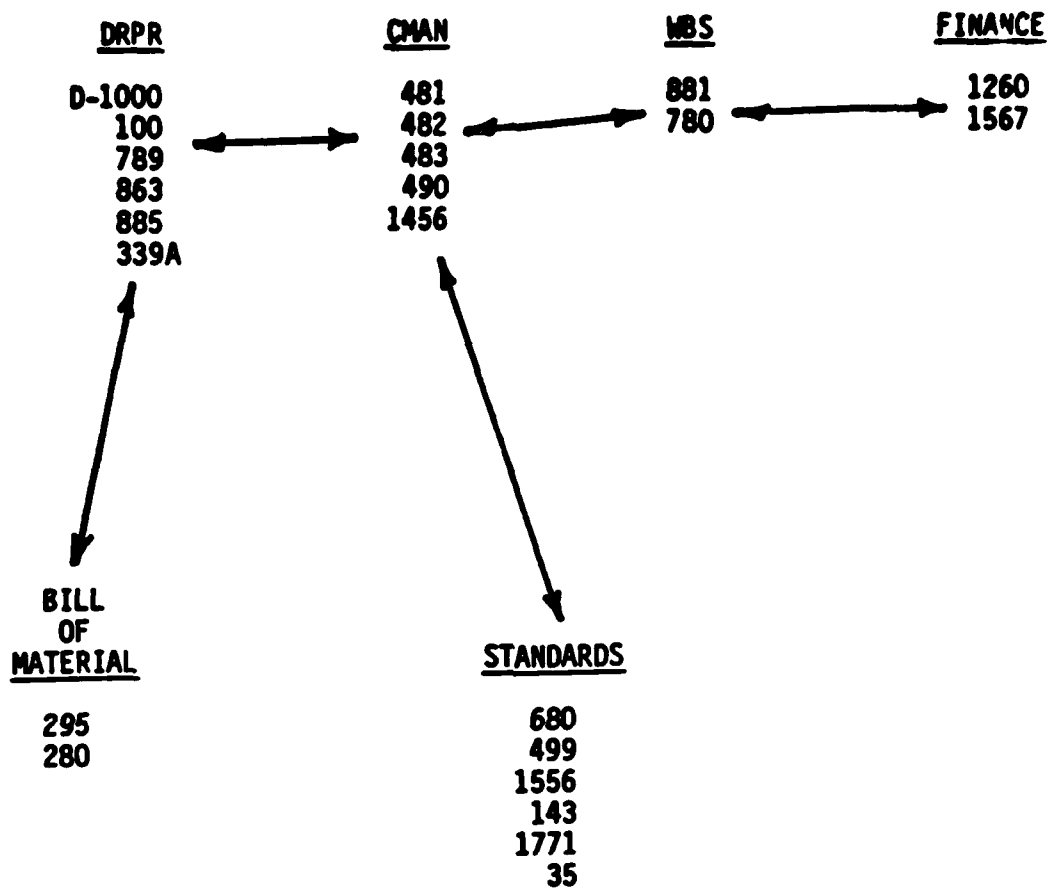
2. Evaluate data requirements for suitability to a structured format that could be automated.

3. Evaluate program for common data elements that could serve as "index" or "search key" for access/formatting data. This index key could also provide relationship or cross references to other functional areas. Examples of common data elements might include:

- NSN
- Part Number
- WPS identifier
- "FINDER" Number

4. Evaluate program structure, if any, for relationship or correspondence to other program areas, and to the development cycle of the weapon system.





MAINTAINABILITY

RELIABILITY

2084
471
470

790
217
251
1543
217
756

SAFETY

882

MARKING

PACKAGING

792
130
196
187
802
1559
842
FED - 123
129
1247

648
2073
1365
1366
726
647

CONFIGURATION MANAGEMENT OVERVIEW

PLANS

BASELINES

- FUNCTIONAL

- ALLOCATED

- PRODUCT

CHANGE DOCUMENTS

- ECPs

- DEVIATIONS AND WAIVERS

- SPECIFICATION CHANGE NOTICES

CONFIGURATION STATUS ACCOUNTING

AUDIT, REVIEWS AND TESTS

- SYSTEM REQUIREMENTS REVIEW

- SYSTEM DESIGN REVIEW

- PRELIMINARY DESIGN REVIEW

- CRITICAL DESIGN REVIEW

- FORMAL QUALIFICATION REVIEW

- FUNCTIONAL CONFIGURATION AUDIT

- PHYSICAL CONFIGURATION AUDIT

PLANNING DOCUMENTS

MIL-STD-483

DI-E-3108 Config. Mgmt. Plan
DI-E-5603 Physical Conf. Audit Plan
DI-E-20463 Plan, Installation & Integration
DI-T-30705 System Test Plan
DI-T-30714 Master Test Plan/Program Test Plan

MIL-STD-1456

DI-E-1100 CM Plan
DI-E-2035 CM Plan

MIL-STD-1521

UDI-E-25621 Plan, Configuration Audit

SSPI 4130.2 Rqmts for CM Plans

(Unnumbered) CM Plan

SAMSO STD 77-6 System Reqmts Analysis for M-X

DI-S-30603 Test Planning Analysis Data
DI-S-30605 LSA Data

SPECIFICATION DOCUMENTS

MIL-S-83490

DI-E-5390 - Configuration Item Spec

MIL-STD-490

DI-E-1104 Specifications
DI-E-3101 System Specification
DI-E-3102 Conf. Item Development Spec
DI-E-3103 Conf. Item Fabrication Spec
DI-E-3105 Inventory Item Spec
DI-E-3117 System Segment Spec
DI-E-3130 Process Spec
DI-E-3131 Material Spec
DI-E-3132 Conf. Item Product Function Spec
U-H-5593 Automated Data Systems Functional Description
DI-E-30131 Interface Control Document
DI-E-30132 Critical Item Fabrication Spec
DI-E-30141 Interface Specification

MIL-STD-483

DI-E-3101 Listed Above
DI-E-3104 Addendum Spec
DI-E-3105 Listed Above
DI-E-30110 Computer Program Product Spec
DI-E-30111 Computer Program Flow Charts
DI-E-30113 Computer Program Development Spec
DI-E-3119 Computer Program Development Spec
DI-E-3120 Computer Program Product Spec
DI-E-30130 Noncomplex Computer Program Spec

MIL-STD-961A

DI-S-7097 Military Spec

CHANGE DOCUMENTS

MIL-STD-481

DI-E-2038 ECPs and Requests for Dev/Waiver
DI-E-3129 Request for Deviation/Waiver
DI-E-4527 ECP
DI-E-5054 Engineering Changes, Deviations & Waiver
DI-E-5383 Engineering Changes, Deviations EAM Cards
& Listings

MIL-STD-483

DI-E-3106 Specs Maintenance Document
DI-E-3134 Spec Change Notice
DI-E-5034 ECPs, Deviations and Waivers
DI-E-5035 ECPs, Deviations and Waivers
DI-A-3020 Contract Change Proposal
DI-E-3127 Advance Change Study Notice

MIL-STD-490

DI-E-1126 Notice of Revision/Spec Change Notice
DI-E-3128 ECPs
DI-E-3134 Spec Change Notice (Computer Program)
DI-E-21430 Spec Revision Pages
DI-E-23159 Changes to General Specs for Ships

MIL-STD-1456

DI-E-1143 Notification of Changes to Commercial Software

AUDITS AND REVIEWS AND TESTS

MIL-N-18307

DI-E-2000 MK/MOD Nomenclature Request

MIL-STD-483

DI-E-3107 Installation Completion Notification

DI-T-3703 Computer Program CM Test Plans

DI-E-5486 Certificate of Acceptance

MIL-STD-490

DI-E-2121 Certificate of Compliance

DI-T-3714 Acceptance Test Procedures

U-T-5594 Test Analysis Report

DI-T-30705 System Test Plan

DI-T-30714 Master Test Plan/Program Test Plan

DI-T-30716 Computer Program Test Procedures

MIL-STD-1521

DI-A-3029 Agenda, Reviews and conf. Audits

DI-E-3118 Minutes of Formal Reviews and Audits

DI-T-3703 Computer Program CM Test Procedures

DI-E-5423 Design Review Data Package

DI-A-7088 Conference Agenda

DI-A-7089 Conference Minutes

STATUS ACCOUNTING

MIL-STD-482

DI-E-1101 Conf. Status Accounting Records
DI-E-2039 Reports, Config. Status Account
DI-E-3133 CM Accounting Reports
DI-E-21473 Missile Configuration Report
DI-E-26361 Report, Ship Equipment Accounting

MIL-STD-483

DI-E-3122 Configuration Index
DI-E-3123 Change Status Report
DI-S-3581 Subsystem Design Analysis Report
DI-S-3582 Engineering Development Report
DI-E-30145 Computer Software Conf. Items

Appendix C

UNIVERSAL NUMBERING SYSTEM

UNIVERSAL NUMBERING SYSTEM

PROBLEM STATEMENT: Enormous inefficiencies result from a lack of compatability in the names that we assign to items. The roots of the problem are interestingly contained in our good deeds of the past. Data processing applications have generally progressed within functional bounds, i.e., cost accounting, supply maintenance and so forth. Outstanding results have accrued from these applications within companies and the government. Similar results have been envisioned and in some cases realized from company to company and company to government. The essential ingredient for such achievements is a set of common data elements/definitions. In many cases it has literally taken years to reach agreements as to common terms and/or data elements within functional areas wherein goals were at least similar. Today's evolving computer and telecommunications technology offer the potential for even more powerful results. It won't be easy! Each functional area that has progressed to the point of a standard set of data elements will resist going through that trauma again, especially since the next set of gains fall outside their area. These gains generally will cross current functional lines and will have to have support at top level.

In addition, many military standards and military specifications have required development of different and independent data systems, component numbering systems and numbering schemes. As a result, service and contractor functions have created specialized data bases which deal with some weapon systems but do not relate to one another. This creates significant problems and increases the cost for users (services and contractors) who could otherwise share common data.

TASK: Therefore, the task is to develop a recommendation with support documentation for application of a universal numbering system (ala Functionally INtegrated DESignating and Referencing--FINDER system).

EXAMPLE: Cost accounting, maintainability and logistics support analysis (LSA) groups of major prime contractor have independent data bases which refer to the F-16 flight control computer by a completely different number. Specifically, cost accounting uses work breakdown structure (WBS) number 1340 while maintainability people use work unit code (WUC) 14AAO and the LSA group uses LSA control number (LSACN) 14F00005. Obviously, additional contractual effort and funding is required to tie or integrate these very important disciplines together.

SOLUTION: Specify by mil standard or specification a standard numbering system which all functional disciplines use and upon which they build their data bases. In the future, all users must be able to use the technology available to create, store, distribute and share technical information. Unified data bases, build upon standard numbering schemes makes this goal more achievable and certainly more affordable.

APPLICATION: Assuming all parties involved in the FXX development, production and deployment decided to designate the flight control computer, uniformly 2710C1 for example, and all FXX data bases related information to that number; then many very positive spinoff capabilities would exist. For example:

a. During production and prior to first aircraft deployment, all failures and maintenance actions are accumulated and available under a single number. The cost of production should be lowered through more expeditious troubleshooting, repair and redesign when required.

b. Assuming we change the service data system to use this number instead of what it uses now, then failure, maintenance actions and performance data can be "real time" fed into the "unified data bases" and like the contractor experience data can be easily assessed with a like reduction in maintenance related man hours and cost.

c. Using a data system like this helps lead us in to weapon system accountability via spare parts accountability. Indication of sources, i.e., performance, MTBF, man hour

expended, etc., are inherently available and management attention to problem areas is expedited.

ACTION: The incorporation of a "FINDER like system will be just as comprehensive as the embedded computer interface standard (MIL STD 1553B and 1750A) as both have their roots in every area of a weapon system including design, development, production and deployment. MIL STDs 1553B and 1750A were recently dictated by DoD. A similar challenge was faced with the implementation of ADA. We feel that the potential cost savings, simplification of relational data systems, potential for elimination hundreds of special purpose data systems, etc. warrant a special research effort to fully investigate the advisability of mandating such a system now or in the future.

Appendix D

ILS DATA DELIVERABLES WHICH ARE CANDIDATES
FOR DIGITAL DELIVERY IN NEUTRAL FORMAT

CONTENTS

Logistic Support for USAF Programs.....	D-3
Logistic Support for USN Programs.....	D-9
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LOGISTIC SU. R1 FOR USAF PROGRAMS

ELEMENT	PROJECTED PRODUCTS	DESCRIPTIONS	SHARED WITHIN CONTR	SHARED WITH GOV'T & OTHER CONTRS	SHARED WITHIN GOV'T	NEUTRAL FORMAT REQ'D
1. Maintenance Planning	Logistic Support Analysis	Identify logistic support needed for new or significantly modified weapon systems and equipment.	H1	H1	H1	Yes*
	Maintenance Plans and Indexes	Identify and document scheduled and unscheduled maintenance requirements for equipment and components.	H1	H1	H1	Yes*
	Maintenance Monitoring Analyses and Studies	Validate maintenance plan through engineering evaluation of operational and repair data.	H1	Lo	Lo	Yes (GENCODE and IGES)
	Failure Report Analyses	Identify and document weapon system failures	H1	H1	H1	Yes*
	Maintenance Action Analyses and Reporting	Identify and document weapon system operational usage.	Lo	Lo	H1	Yes (GENCODE)
2. Manpower and Personnel	Squadron Manning Table	Identify military and civilian personnel skills and grades required to operate and support a weapon system during peacetime and wartime.	H1	H1	H1	Yes (GENCODE)

* Information stored and forwarded electronically should conform to an accepted standard data format. Automated data element dictionaries should contain and describe these standards (much like the IGES directory currently does) for each data set of information, which suggests a neutral format for maximum utility.

LOGISTIC SL JRT FOR USAF PROGRAMS

ELEMENT	PROJECTED PRODUCTS	DESCRIPTIONS	SHARED WITH			NEUTRAL FORMAT REQ'D
			SHARED WITHIN CONTR	SHARED WITH OTHER CONTS	SHARED WITHIN GOV'T	
3. Supply Support	Provisioning	Document the spares and repair parts, tools, and test equipment required to repair and maintain equipment and components per weapon system.	H1	Lo	H1	Yes (MIL-STD-1552)
	Configuration Records	List of weapon system equipment, components, and equipage showing service application and location.	H1	H1	Lo	Yes*
	Repair Parts List	List of repair parts, tools, and test equipment stocked at base level.	H1	Lo	H1	Yes*

* Information stored and forwarded electronically should conform to an accepted standard data format. Automated data element dictionaries should contain and describe these standards (much like the IGES directory currently does) for each data set of information, which suggests a neutral format for maximum utility.

LOGISTIC SU A1 FOR USAF PROGRAMS

ELEMENT	PROJECTED PRODUCTS	DESCRIPTIONS	SHARED WITH			NEUTRAL FORMAT REQ'D
			SHARED WITHIN CONTR	GOV'T & OTHER CONTRS	SHARED WITHIN GOV'T	
4. Support Equipment	Storage List	List identifying location and facilities for repair parts, tools, test equipment, general use consumables, and medical supplies.	H1	Lo	H1	Yes*
	General Purpose Support Equipment List	General purpose/support equipment utilized to support a weapon system.	H1	Lo	H1	Yes*
	Special Purpose Support Equipment List	Support equipment used for unique applications.	H1	Lo	Lo	Yes*
	Tool List	Identify tools	H1	Lo	H1	Yes*

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LOGISTIC SUPPORT FOR USAF PROGRAMS

ELEMENT	PROJECTED PRODUCTS	DESCRIPTIONS	SHARED WITH			NEUTRAL FORMAT REQ'D
			SHARED WITHIN CONTR	SHARED GOV'T & OTHER CONTRS	SHARED WITHIN GOV'T	
5. Technical Data	Weapon System Drawing Index	Listing of weapon system drawings	H1	H1	H1	Yes*
	Weapon System Drawings	Production drawings required for repair and modification of equipment and weapon systems	H1	H1	Lo	Yes*
	Weapon System Technical Analysis	Reports containing Weapon system analysis for evaluation of special circumstances, repairs and modifications.	H1	H1	H1	Yes*
	Technical Order Index	List identifying equipment and weapon system technical orders	H1	H1	H1	Yes*
	Technical Orders	Technical orders required for operation and maintenance of equipment and weapon systems.	H1	H1	H1	Yes (GENCCODE, IGES, and GKS)
	Time Compliance Technical Orders	Technical orders required for modifications and special one time inspections of equipment and weapon systems.	H1	H1	H1	Yes*

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LOGISTIC SL INT FOR USAF PROGRAMS

ELEMENT	PROJECTED PRODUCTS	DESCRIPTIONS	SHARED WITH			NEUTRAL FORMAT REQ'D
			SHARED WITHIN CONTR	GOV'T & OTHER CONTRS	SHARED WITHIN GOV'T	
6. Training and Training Support	Training Material	Training courses consisting of lesson plans and guides, lecture notes, audio-visual aids, and classroom texts and achievement tests.	Lo	Lo	H1	Yes (GENCODE, IGES, and GKS)
	Training Simulations and Simulators	Computer simulations and simulators for maintenance training.	Lo	H1	H1	Yes (IGES)
7. Facilities	Facilities Analyses and Studies	Identify Air Force and Contractor facility requirements to operate, modify, inspect and repair a weapon system.	H1	Lo	H1	Yes (GENCODE)
8. Packaging, Handling, Storage, and Transportation	Receiving and Inspection Report	Document receipt and inspection of material received for substitutions, shortages, damages, or other discrepancies.	Lo	Lo	Lo	Yes (GENCODE)
	Purchase Order Specifications	Require vendor to adhere to prescribed packaging, handling, storage, and transportation requirements.	Lo	Lo	H1	Yes (GENCODE)
	Excess and Shortage Reports	Identify allowance shortages and excess material.	H1	Lo	Lo	Yes (GENCODE)

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LOGISTIC SUP FOR USAF PROGRAMS

ELEMENT	PROJECTED PRODUCTS	DESCRIPTIONS	SHARED WITH CONTR	SHARED WITH GOV'T & OTHER CONTRS	SHARED WITHIN GOV'T	NEUTRAL FORMAT REQ'D
9. Design Interface	Reliability/Maintainability/Availability Analyses and Studies	Assess the ability of equipment and components to satisfy established mission and safety requirements.	H1	H1	H1	Yes (GENCODE)
	Human Engineering Analyses and	Assess man-machine element in the operation, maintenance, and support of a weapon system.	H1	H1	H1	Yes (GENCODE and IGES)
	QAC Data	Assess QAC Req	H1	Lo	H1	
	ILS-Related Analyses and Studies	Assess impact of products generated by the other eight ILS elements on the system's design.	H1	Lo	Lo	Yes (GENCODE and IGES)
	Design Analyses Stress, Flutter, Etc.	Assess Life of damage parts	H1	H1	H1	
10. DoD/DLA Policy	Contractor Repair Data	Repairability/Studies	H1	H1	H1	
	Component Service Policy	Define programs within DoD, including conditions of readiness	Lo	H1	H1	Yes (GENCODE)

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LOGISTIC SUPPORT FOR USN PROGRAMS

J. A. Palmer
Newport News Shipbuilding
August 24, 1984

LOGISTIC SUPPORT: USN PROGRAMS

ELEMENT	PROJECTED PRODUCTS	DESCRIPTIONS	SHARED WITHIN SHIPYARD	SHARED WITH GOV'T & OTHER CONTRS	SHARED WITHIN GOV'T	NEUTRAL FORMAT REQ'D
1. Maintenance Planning	Logistic Support Analysis	Identifies logistic support needed for new or significantly modified systems and equipment.	Hi	Hi	Lo	Yes*
	Maintenance Plans and Indexes	Identify and document scheduled maintenance requirements for shipboard equipment and components.	Hi	Hi	Hi	Yes*
	Maintenance Standards	Provide acceptance/rejection criteria for the repair or restoration of systems, equipment, and components.	Hi	Hi	Lo	Yes (GEMCODE and IGES)
	Maintenance Monitoring Analyses and Studies	Validate maintenance plan through engineering evaluation of operational and repair data.	Lo	Lo	Lo	Yes (GEMCODE and IGES)
2. Manpower and Personnel	Ship Manpower Document	Identifies military and civilian personnel skills and grades required to operate and support a ship during peacetime and wartime.	Lo	Lo	Hi	Yes (GEMCODE)

* Information stored and forwarded electronically must conform to an accepted standard. Automated data element dictionaries could describe these standards (such like the IGES directory currently does) for each set of information, thus providing a neutral format.

LOGISTIC SUPPORT (USN PROGRAMS)

ELEMENT	PROJECTED PRODUCTS	DESCRIPTIONS	SHARED WITHIN SHIPYARD	SHARED WITH GOV'T & OTHER CONTRA	SHARED WITHIN GOV'T	NEUTRAL FORMAT REQ'D
3. Supply Support	Provisioning	Documents the spares and repair parts, tools, and test equipment required to repair and maintain equipment and components per ship.	Hi	Lo	Lo	Yes (MIL-STD-1552)
	Ship Configuration Records	List of shipboard equipment, components, and equipment showing service application and location.	Hi	Hi	Lo	Yes*
	On-board Repair Parts List	List of repair parts, tools, and test equipment stored on-board ship.	Hi	Lo	Lo	Yes*
	Stowage List	List identifying shipboard location and facilities for repair parts, tools, test equipment, general use consumables, and medical supplies.	Hi	Lo	Lo	Yes*
4. Support Equipment	General Purpose Electronic Test Equipment List	Electronic test equipment utilized throughout the ship.	Hi	Lo	Lo	Yes*
	Special Purpose Electronic Test Equipment List	Electronic test equipment used for unique applications.	Hi	Lo	Lo	Yes*

* Information stored and forwarded electronically must conform to an accepted standard. Automated data element dictionaries could describe these standards (much like ICES directory currently does) for each set of information, thus providing a neutral format.

LOGISTIC SUPPORT USN PROGRAMS

ELEMENT	PROJECTED PRODUCTS	DESCRIPTIONS	SHARED WITHIN SHIPYARD	SHARED WITH GOV'T & OTHER CONTRA	SHARED WITHIN GOV'T	NEUTRAL FORMAT REQ'D
4. Cont'd	Tool and Test Equipment List	Identifies non-electrical/electronic tool and test equipment.	NI	Lo	Lo	Yes*
5. Technical Data	Ship Drawing Index	Listing of ship drawings	NI	NI	NI	Yes*
	Ship Drawings	Document the as-built or as-overhauled configuration of ship systems and equipment.	NI	NI	NI	Yes (IGES)
	Technical Manual Index	List identifying equipment and system technical manuals.	NI	NI	NI	Yes*
	Technical Manuals	Technical manuals required for operation and maintenance of equipment and systems.	NI	NI	NI	Yes (GENCODE, IGES, and GMS)
6. Training and Training Support	Training Material	Training courses consisting of lesson plans and guides, lecture notes, audio-visual aids, and classroom tests and achievement tests.	Lo	Lo	NI	Yes (GENCODE, IGES, and GMS)
	Simematic Training Simulations	Computer simulation training for ship operation and maintenance.	Lo	NI	NI	Yes (IGES)

* Information stored and forwarded electronically must conform to an accepted standard. Automated data element dictionaries could describe these standards (such like the IGES directory currently does) for each set of information, thus providing a neutral format.

LOGISTIC SUPPORT USN PROGRAMS

ELEMENT	PROJECTED PRODUCTS	DESCRIPTIONS	SHARED WITHIN SHIPYARD	SHARED WITH GOV'T & OTHER CONTRA	SHARED WITHIN GOV'T	NEUTRAL FORMAT REQ'D
7. Facilities	Facilities Analyses and Studies	Identifies Naval and Contractor facility requirements to design, construct, and operate a class of ships.	Lo	Lo	Lo	Yes (CEMCODE)
8. Packaging, Handling, Storage, and Transportation	Receiving and Inspection Report	Documents receipt and inspection of material received for substitutions, shortages, damages, or other discrepancies.	Lo	Lo	Lo	Yes (CEMCODE)
	Purchase Order Specifications	Require vendor to adhere to prescribed packaging, handling, storage, and transportation requirements.	Lo	Lo	Lo	Yes (CEMCODE)
	Excess and Shortage Reports	Identifies allowance shortages and excess material.	Hi	Lo	Lo	Yes (CEMCODE)
9. Design Interface	Reliability/Maintainability/Availability Analyses and Studies	Assess the ability of equipment and components to satisfy established mission and safety requirements.	Hi	Lo	Lo	Yes (CEMCODE and IGES)
	Human Engineering Analyses and Studies	Assess man-machine element in the operation, maintenance, and support of the ship.	Hi	Lo	Lo	Yes (CEMCODE and IGES)

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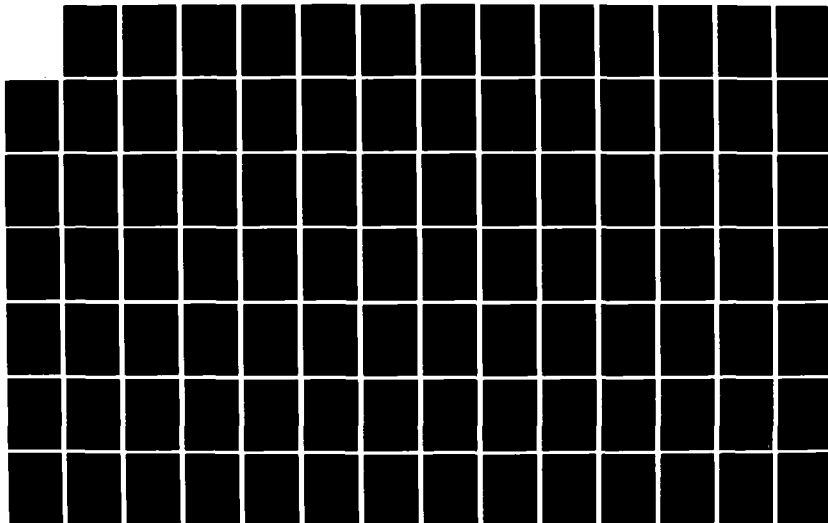
REPORT OF THE JOINT INDUSTRY - DOD TASK FORCE ON
COMPUTER AIDED LOGISTIC... (U) INSTITUTE FOR DEFENSE
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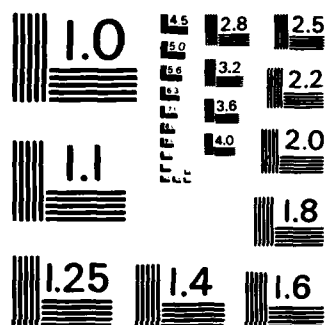
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LOGISTIC SUPPORT * USN PROGRAMS

ELEMENT	PROJECTED PRODUCTS	DESCRIPTIONS	SHARED WITHIN SHIPYARD	SHARED WITH GOV'T & OTHER COUNTRIES	SHARED WITHIN GOV'T	NEUTRAL FORMAT REQ'D
9. Design Interface (Cont'd)	ILS-Related Analyses and Studies	Assess impact of products generated by the other eight ILS elements on the ship's design.	NI	Lo	Lo	Yes (GBM0000 and IGES)
	Qualified Equipment List	Equipment/components qualified for use on a particular class of ships.	NI	NI	NI	Yes (GBM0000)

COMPUTER AIDED LOGISTIC SUPPORT (CALS)

LOGISTIC SUPPORT CONTRACT ANALYSIS

- o CONSTRAINTS
- o POLICY
- o CHANGES

LOGISTIC SUPPORT CONTRACT ANALYSIS

Logistic support (LS) contract requirements imposed on three typical McDonnell Aircraft Company programs were reviewed to identify constraints/changes needed to implement a support program in a total electronic environment.

Our conclusions are summarized as follows:

- A) The CDRL DD Form 1423 could be utilized to revise the delivery media from paper to electronic form.
- B) A technique must be established to define customer reviews, controllable audits, and acceptance for computerized data.
- C) Computer data control methods must be established to control working data, proposed data, approved data, and archival storage. In short, an audit trail is needed for review/approval/legal purposes, i.e., accident suits, etc.
- D) No standard exists which defines electronic transmission media.
- E) The training/publications community must reorganize their current methods to development and conduct their support service.

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General Acquisition Management and Information Documents

<u>Document</u>	<u>Description/Application</u>	<u>Current Deliverable</u>	<u>Specific Deliverable Reference/Remarks</u>
DOD 5000.1	Major System Acquisition	None	General acquisition policy for DOD.
DOD 5000.2	Major System Acquisition Procedures	None	General acquisition procedures for DOD
DOD 5000.19	Policies for the Management and Control of Information Requirements	None	General policy for DOD information flow.
DOD 5000.39	Acquisition and Management of Integrated Logistics Support for Systems and Equipment	None	ILS Policy guidance for DOD.
AFR 800-2	Acquisition Program Management (USAF)	None	Implements DOD 5000.1 and DOD 5000.2
AFR 800-8	Integrated Logistics Support (ILS) Program	None	Implements DOD 5000.39
AFR 310-1	Management of Contractor Data	None	Implements DOD 5000.19 Specifically states; "Except for data specifically required by standard and DAR clauses, the CDRL or its mechanical equivalent, which must have the same format and item entries as DD Form 1423, is the sole list of contract data requirements for the amounts and kinds of data to be delivered under a given contract."

General Acquisition Management and Information Documents (Continued)

<u>Document</u>	<u>Description/Application</u>	<u>Current Deliverable</u>	<u>Specific Deliverable Reference/Remarks</u>
SECNAVINST 5000.1	System Acquisition in the Department of Navy	None	Implements DOD 5000.1 and 5000.2
SECNAVINST 4000.29	Development of Integrated Logistics Support for Systems/Equipment	None	Implements DOD 5000.39
OPNAVINST 4100.3	Department of the Navy Integrated Logistics Support System	None	Implements SECNAVINST 4000.29
NAVJATINST 4000.20	Integrated Logistics Support (ILS) Planning Policy	None	Together with 4100.3 implements SECNAVINST 4000.29
NAVJATINST 4000.15	Department of the Navy Data Management Program	None	Implements DOD 5000.19 specifically states; "All deliverable data requirements, except those specified in a standard ASPR Clause, shall be listed on the Contractor Data Requirement List (DD Form 1423)."
DOD 4100.35G AFR 800-8 VOL. I CDRL 1006 UOI-A-21201/T VOL. II CDRL 1001 UOI-A-21201/T	The ILS Plan Reports Program Status and Problems includes section for action items.	F-15 MSIP/DRF ILS Plan (Volumes I & II)	30 days after conclusion of USAF/MCAIR ILS Management Team meetings, not to exceed four per year.

This document could be transmitted electronically with no apparent changes.

SUPPORTABILITY AND LOGISTIC SUPPORT ANALYSIS

SOURCE DOCUMENT	APPLICATION	DELIVERABLES	REFERENCE PARAGRAPH	RECOMMENDATION
MIL-STD-470A MAINTAINABILITY PROGRAM FOR SYSTEMS AND EQUIPMENT	PROVIDES TASK DESCRIPTION FOR MAINTAINABILITY PROGRAMS. SOFTWARE IS NOT COVERED BY THIS STANDARD.	-DI-R-7103 MAINTAINABILITY PROGRAM PLAN -DI-R-7104 MAINTAINABILITY STATUS REPORT -DI-R-7105 DATA COLLECTION, ANALYSIS AND CORRECTIVE ACTION SYSTEM -DI-R-7106 MAINTAINABILITY MODELING REPORT -DI-R-7107 MAINTAINABILITY ALLOCATIONS REPORT -DI-R-7108 MAINTAINABILITY PREDICTIONS REPORT -DI-R-7109 MAINTAINABILITY ANALYSIS REPORT -DI-R-7110 MAINTAINABILITY DESIGN CRITERIA PLAN -DI-R-7111 INPUTS TO THE DETAILED MAINTENANCE PLAN AND LSA -DI-R-7112 MAINTAINABILITY DEMO TEST PLAN -DI-R-7113 REPORT, MAINTAINABILITY DEMO	50.0 APPENDIX A	ENTIRE MIL-STD-470A DEFINES TYPE OF INFORMATION TO BE CONTAINED WITHIN EACH DID. NOTE 1 OF PARA 50 SPECIFIES THAT "ONLY DATA ITEMS SPECIFIED IN THE CDRL ARE DELIVERABLE.."; THEREFORE, IT IS RECOMMENDED THAT THE FORMAT OF DELIVERABLES BE NEGOTIATED WITHIN EACH DATA ITEM DESCRIPTION (DID), BETWEEN THE CONTRACTOR AND CUSTOMER AT THE TIME OF CDRL NEGOTIATIONS.

SUPPORTABILITY AND LOGISTIC SUPPORT ANALYSIS

SOURCE DOCUMENT	APPLICATION	DELIVERABLES	REFERENCE PARAGRAPH	RECOMMENDATION
MIL-STD-470A (Cont)		-DI-R-7111 INPUTS TO THE DETAILED MAINTENANCE PLAN AND LSA -DI-R-7112 MAINTAINABILITY DEMO. TEST PLAN -DI-R-7113 REPORT, MAINTAINABILITY DEMO		
MIL-STD-482A CONFIGURATION STATUS ACCOUNTING DATA ELEMENTS AND RELATED FEATURES.	ESTABLISHES THE DATA ELEMENTS, AND THEIR RELATED DATA ITEMS TO BE USED AS THE CONTENT OF CONFIGURATION STATUS ACCOUNTING RECORDS.	APPENDIX 1 DEFINES 191 DATA ELEMENTS. SOME OR ALL MAY BE NEEDED DEPENDING UPON TYPES OF REPORTS NEGOTIATED.	APPENDIX 1, 11, 111 PARA 4.2, 4.21, 4.2.2	APP. II P. 11-96 DEFINE E.D.P. METHODS OF RECORDING DATA. THIS MAY HAVE TO BE UPDATED TO REFLECT "STATE OF THE ART" TECHNIQUES FOR MASS STORAGE OF DATA. APP III ILLUSTRATES TYPICAL REPORTS. THIS MAY NEED AMENDING FOR E.D.P. PURPOSES. PARAGRAPHS 4.2, 4.2.1, AND 4.2.2 STATE THAT THE PROCURING ACTIVITY WILL DETERMINE WHICH STATUS ACCOUNTING INFORMATION IS REQUIRED, INCLUDING FORMAT AND FREQUENCY. 4.2.2 ALSO STATES THAT REPORT CONTENT AND FORMAT ARE NEGOTIABLE AND ALTERNATIVE PROPOSALS MAY BE SOLICITED.

SUPPORTABILITY AND LOGISTIC SUPPORT ANALYSIS

SOURCE DOCUMENT	APPLICATION	DELIVERABLES	REFERENCE PARAGRAPH	RECOMMENDATION
MIL-STD-482A (Cont)				THEREFORE, IT IS RECOMMENDED THAT AT THE TIME OF CDRL NEGOTIATIONS, AN AUTOMATED SYSTEM BE PROPOSED, WHICH IS COMPATIBLE WITH THE CONTRACTUAL DID'S.
MIL-STD-781C RELIABILITY DESIGN QUALIFICATION AND PRODUCTION ACCEPTANCE TESTS: EXPONENTIAL DISTRIBUTIONS	COVERS THE REQUIREMENTS FOR RELIABILITY QUALIFICATION TESTS AND RELIABILITY ACCEPTANCE TESTS.	-DI-R-5299C FAILURE ANALYSIS AND CORRECTIVE ACTION REPORT -DI-R-5468A QUALITY STATUS/REL. SUMMARY REPORT -DI-R-7033 PLAN, REL. TEST -DI-R-7034 REPORTS, REL. TEST AND DEMO -DI-R-7035 PROCEDURES, REL. TEST -DI-R-7036 REPORT, THERMAL SURVEY -DI-R-7037 REPORT, VIBRATION SURVEY -DI-R-7038 PLAN CORRECTIVE ACTION -DI-R-7039 REPORT, FAILED ITEM ANALYSIS -DI-R-7040 REPORT, BURN-IN TEST -DI-R-7041 REPORT, FAILURE SUMMARY AND ANALYSIS	APPENDIX F PARA 10.2	PARA 10.2 OF APPENDIX F STATES "WHEN DATA REQUIREMENTS ARE INCLUDED IN THE DD FORM 1423, (CDRL) THE CONTRACTORS FORMAT SHOULD BE USED UNLESS THERE ARE CONSIDERABLE SAVINGS TO THE PROCURING ACTIVITY THROUGH THE USE OF A SPECIFIED FORMAT."
				RECOMMEND DEVELOPMENT OF A STANDARDIZED EDP FORMAT FOR MEETING THE DID REQUIREMENTS OF THIS SPEC.

SUPPORTABILITY AND LOGISTICS SUPPORT ANALYSIS

SOURCE DOCUMENT	APPLICATION	DELIVERABLES	REFERENCE PARAGRAPH	RECOMMENDATION
MIL-STD-756B RELIABILITY MODELING AND PREDICTION	ESTABLISHES UNIFORM PROCEDURES AND GROUND RULES FOR THE BASIC PREPARATION OF MISSION RELIABILITY AND BASIC RELIABILITY MODELS.	-DI-R-7094 REL. BLOCK DIAGRAMS AND MATH MODELS REPORT -DI-R-7095 REL. PREDICTION AND DOCUMENTATION OF SUPPORTING DATA -DI-R-7100 REL. REPORT FOR EXPLORATORY ADVANCED DEVELOPMENT MODEL.	APPENDIX A, PARA. 10.2	STATES THAT THE DEPTH AND DETAIL OF THE REL. MODELING AND PREDICTION EFFORT WILL BE DEFINED IN APPROPRIATE CONTRACTUAL DOCUMENTATION. RECOMMEND FORMAT OF DELIVERABLES BE NEGOTIATED BETWEEN CONTRACTOR AND CUSTOMER DURING CDRL NEGOTIATIONS.
MIL-STD-831 TEST REPORTS, PREPARATION OF	DELINEATES THE FORMAT AND CONTENT CRITERIA TO BE USED IN TEST REPORTS.	-DI-R-1724 QUALITY INSPECTION TEST, DEMO. AND EVAL. REPORT -DI-T-2072 REPORTS, TEST -DI-T-3721A ACCEPTANCE TEST REPORT -DI-T-3727A WEAPONS DELIVERY CAPABILITY REPORT -DI-T-4901 FIRST ARTICLE INSPECTION PROCEDURE -DI-T-4902 FIRST ARTICLE INSPECTION REPORT -DI-T-4909 TEST AND EVALUATION REPORT		NO MENTION OF E.D.P. SYSTEMS IN THIS MIL-STD; RECOMMEND THAT THE ENTIRE SPEC. BE AMENDED TO INCLUDE MENTION OF ELECTRONIC TRANSMISSION OF DATA.

SUPPORTABILITY AND LOGISTICS SUPPORT ANALYSIS

SOURCE DOCUMENT	APPLICATION	DELIVERABLES	REFERENCE PARAGRAPH	RECOMMENDATION
MIL-STD-831 (Cont)		<ul style="list-style-type: none"> -UDI-P-20236D PRODUCTION AND FACILITIES PLAN, FOLLOW-ON -UDI-R-20339D CERTIFICATION DEMO. PROCEDURES -UDI-P-20414 PRODUCTION AND FACILITIES PLAN -UDI-E-20433 ACCEPTANCE TEST PROCEDURES -UDI-T-21332 REPORT, TEST, SYSTEM E.M.C. -UDI-L-23860A PLAN, DATA PACKAGE DEMO AND VALIDATION 		
MIL-STD-882A SYSTEM SAFETY PROGRAM REQUIREMENTS	PROVIDES UNIFORM REQUIREMENTS FOR DEVELOPING AND IMPLEMENTING A SYSTEM SAFETY PROGRAM TO IDENTIFY HAZARDS OF A SYSTEM.	<ul style="list-style-type: none"> -DI-H-1332A RADIOACTIVE MATERIAL DATA -DI-T-1911 TOXICITY REPORT, PROTECTIVE MASKS -DI-E-3115B CLASS II MODIFICATION DOCUMENTATION -DI-H-7047 SYSTEM SAFETY PROGRAM PLAN -DI-H-7048 SYSTEM SAFETY HAZARD ANALYSIS REPORT -DI-H-7049 SAFETY ASSESSMENT REPORT 	APPENDIX	NEED REVIEW OF DI-R-3531 (USAF) DI-H-1320A (ARMY) TO DETERMINE FORMAT.

SUPPORTABILITY AND LOGISTIC SUPPORT ANALYSIS

SOURCE DOCUMENT	APPLICATION	DELIVERABLES	REFERENCE PARAGRAPH	RECOMMENDATION
MIL-STD-882A (Cont.)		-DI-H-7050		
		SYSTEM SAFETY		
		ENGINEERING REPORT		
		-DI-H-7102		
		AMMUNITION		
		DEMILITARIZATION AND		
		DISPOSAL PLAN		
		-UDI-H-21420		
		NUCLEAR SAFETY ANALYSES		
		AND HAZARD EVALUATION		
		REPORT		
		-UDI-A-23075A		
		FIRE PROTECTION PLAN,		
		ORGANIZATION CHART,		
		INSTRUCTIONS, AND		
		FLOODING CHART		
		-UDI-A-23081		
		PLAN, STABILITY CONTROL		
		-UDI-H-23374		
		HANDBOOK, FIRE		
		PROTECTION		
		PROGRAM OVERVIEW AND		
		PROCESS REPORTS		
		-UDI-H-23375		
		HANDBOOK, FIRE		
		PROTECTION DRAFT		
		SUBMISSION FOR REVIEW		
		AND APPROVAL		
		-UDI-H-23376		
		HANDBOOK, FIRE		
		PROTECTION COPY, COMPLETE		
		-UDI-H-26378		
		LIST, CHECK, SAFETY		
		SYSTEM		
		-DI-A-30015A		
		IMPLEMENTATION		
		MANAGEMENT PLAN/MINOR		
		ACTIVITY MEMO/SAFETY		
		ENG. ANALYSIS		

SUPPORTABILITY AND LOGISTIC SUPPORT ANALYSIS

SOURCE DOCUMENT	APPLICATION	DELIVERABLES	REFERENCE PARAGRAPH	RECOMMENDATION
MIL-STD-847A FORMAT REQUIREMENTS FOR SCIENTIFIC AND TECHNICAL REPORTS PREPARED BY OR FOR THE DEPT. OF DEFENSE.	ESTABLISHES FORMAT REQUIREMENTS FOR SCIENTIFIC AND TECHNICAL REPORTS.	-DI-S-1R01 ENGINEERING ACCOMPLISHMENT REPORT -DI-S-1R04A CORROSION PREVENTION AND MATERIAL DETERIORATION REPORTS AND/OR STUDIES -DI-A-3025A INSTALLATION PROGRESS REPORT -DI-S-4057 SCIENTIFIC AND TECHNICAL REPORTS -DI-A-4058 R & D CONTRACT STATUS REPORTS -DI-A-5008A PROJECT STATUS REPORT -DI-A-5016 PROJECT PLANNING/ACTUAL PROGRESS CHART -DI-A-5023 INTERIM REPORT ON R & D -DI-A-5010B FINAL REPORT	1.3.2	THIS DOCUMENT SPECIFICALLY EXCLUDES <u>COMPUTER PRINT-OUTS.</u> RECOMMEND A DIFFERENT MIL-STD BE IMPOSED ON FUTURE PROGRAMS OR THIS SPEC. MODIFIED TO COVER E.D.P. DATA TRANSMISSION.

SUPPORTABILITY AND LOGIS - SUPPORT ANALYSIS

SOURCE DOCUMENT	APPLICATION	DELIVERABLES	REFERENCE PARAGRAPH	RECOMMENDATION
MIL-STD-847A (Cont)		-DI-P-5401A PRODUCTION & DELIVERY REPORT -UDI-R-20457 REPORT OPERABILITY TEST -UDI-I-20523 FACILITY SUPPORT PROGRAM -UDI-R-22591A REPORT, SITE SURVEY		
MIL-STD-1379B CONTRACT TRAINING PROGRAMS	ESTABLISHES PROCUREMENT REQUIREMENTS FOR CONTRACT TRAINING PROGRAMS.	-DI-H-7066 TRAINING AND TRAINING EQUIP. PLAN -DI-H-7067 TRAINING COURSE PROPOSAL -DI-H-7068 TASK AND SKILL ANALYSIS REPORT -DI-H-7069 TRAINING COURSE/CURRICULUM OUTLINES -DI-H-7070 INSTRUCTOR/LESSON GUIDES-TRAINING COURSES -DI-H-7071 STUDENTS TRAINING COURSE GUIDE -DI-H-7072 AUDIO-VISUAL AIDS, MASTER REPRODUCIBLES AND REVIEW COPIES FOR TRAINING EQUIP. AND TRAINING COURSES -DI-H-7073 AUDIO-VISUAL AIDS INDEX FOR TRAINING EQUIP. AND TRAINING COURSES.	5.5 THRU 5.5.19	SPEC. MENTIONS DELIVERY OF "COPIES". NO MENTION OF MEDIA IS MADE EXCEPT IN THE CASE OF AUDIO-VISUAL MATERIAL. IF MIL-STD-847 (FORMAT REQUIREMENTS) IS AMENDED TO ALLOW FOR E.D.P. TRANSMISSION, THAT SHOULD CARRY OVER TO THIS MIL. SPEC. RECOMMEND FORMAT OF DELIVERABLES BE NEGOTIATED DURING CDRL NEGOTIATIONS.

SUPPORTABILITY AND LOGISTIC SUPPORT ANALYSIS

SOURCE DOCUMENT	APPLICATION	DELIVERABLES	REFERENCE PARAGRAPH	RECOMMENDATION
MIL-STD-1379B (Cont)		-DI-H-7074		
		TESTS FOR MEASUREMENT OF STUDENT ACHIEVEMENT		
		-DI-H-7075		
		STUDENT AND TRAINING COURSE EVALUATION FORM		
		DI-H-7076		
		INSTRUCTORS UTILIZATION HANDBOOK FOR SIMULATION EQUIPMENT		
		-DI-H-7077		
		ON-THE-JOB TRAINING HANDBOOK		
		-DI-H-7078		
		TECHNICAL HANDS-ON TRAINING SYS. PACKETS		
		-DI-H-7090		
		TRAINING PATH SYS. DOCUMENTATION		
		-DI-H-7091		
		PERSONNEL PERFORMANCE PROFILES		
		-DI-H-7092		
		CURRICULUM AND INSTRUCTIONAL MEDIA MATERIALS		
		-DI-H-7093		
		FACTORY TRAINING CURRICULUM MATERIALS		

SUPPORTABILITY AND LOGISTIC SUPPORT ANALYSIS

SOURCE DOCUMENT	APPLICATION	DELIVERABLES	REFERENCE PARAGRAPH	RECOMMENDATION
MIL-STD-1388-1A LOGISTIC SUPPORT ANALYSIS	PROVIDES GENERAL REQUIREMENTS AND TASK DESCRIPTIONS GOVERNING PERFORMANCE OF LOGISTICS SUPPORT ANALYSIS DURING THE LIFE CYCLE OF SYSTEMS AND EQUIPMENT.	-DI-L-7017A LOGISTICS SUPPORT ANALYSIS PLAN -DI-L-7114 LOGISTICS SUPPORT ANALYSIS STRATEGY REPORT -DI-S-7115 USE STUDY REPORT -DI-S-7116 COMPARATIVE ANALYSIS REPORT -DI-S-7117 TECHNOLOGICAL OPPORTUNITIES REPORT -DI-S-7118 EARLY FIELDING ANALYSIS REPORT -DI-P-7119 POST PRODUCTION SUPPORT PLAN -DI-S-7121 SUPPORTABILITY ASSESSMENT PLAN -DI-S-7121 SUPPORTABILITY ASSESSMENT REPORT	APPENDIX A 40.5.2 THRU 40.5.4	40.5.4.b RECOMMENDS USING CONTRACTOR FORMAT WHENEVER POSSIBLE. RECOMMEND NEGOTIATING AND DESCRIPTION AND FORMAT OF DID'S, DURING CDRL NEGOTIATIONS.
MIL-STD-1390B LEVEL OF REPAIR	SPECIFIES METHODS, TIME PHASING AND REPORTING REQUIREMENTS FOR PERFORMING LOR ANALYSIS.	-DI-2082A REPORT, LOR SUMMARY -DI-L-2083A REPORT, LOR STATUS -DI-L-2084A PLAN, LOR PROGRAM -DI-L-2085A REPORT, LOR ANALYSIS -DI-L-2155 REPORT, LOR INPUT DATA -UDI-L-22332C PLAN, PROGRAM, LOR	5.4	5.4 STATES "...LOR DATA REQUIREMENTS WILL NORMALLY BE PREPARED AND FORWARDED TO THE PROCURING ACTIVITY IN ACCORDANCE WITH THE CORRESPONDING DID'S AND WITH THE CDRL." RECOMMEND FORMAT AND CONTENT OF DID'S BE NEGOTIATED AT TIME OF CDRL NEGOTIATIONS.

SUPPORTABILITY AND LOGISTIC SUPPORT ANALYSIS

SOURCE DOCUMENT	APPLICATION	DELIVERABLES	REFERENCE PARAGRAPH	RECOMMENDATION
MIL-STD-1472B HUMAN ENGINEERING DESIGN CRITERIA FOR MILITARY SYSTEMS, EQUIPMENT AND FACILITIES	ESTABLISHES GENERAL HUMAN ENGINEERING CRITERIA FOR DESIGN AND DEVELOPMENT OF MILITARY SYSTEMS.	-UDI-E-22128A DATA, DESIGN OF EQUIPMENT CONSOLES -UDI-H-22274R REPORT, SPEECH INTELLIGIBILITY TEST -UDI-E25561 TRAINER CONFIGURATION REPORT	N/A	NO MENTION OF DELIVERABLE FORMAT.
MIL-STD-1629A PROCEDURES FOR PERFORMING A FAILURE MODE EFFECTS AND CRITICALITY ANALYSIS	ESTABLISHES THE REQUIREMENTS AND PROCEDURES FOR PERFORMING A FMECA.	-DI-R-7085 FMECA REPORT -DI-R-7086 FMECA PLAN	1.2 FIGURES 101.3, 102.1, 103.1, 104.1 Para. 3.2.1	RECOMMEND DELETING REQUIREMENTS FOR HARDCOPY FMECA WORKSHEETS, AMEND WORKSHEET FORMAT TO ALLOW FOR E.D.P. TRANSMISSION, NEGOTIATE FORMAT AND CONTENT OF DID'S AT TIME OF CDRL NEGOTIATIONS.
MIL-STD-1521A TECHNICAL REVIEWS AND AUDITS FOR SYSTEMS, EQUIPMENTS, AND COMPUTER PROGRAMS	PREScribes THE REQUIREMENTS FOR THE CONDUCT OF TECHNICAL REVIEWS AND AUDITS.	-DI-E-1136 SITE FACILITIES DESIGN DATA -DI-A-3029 AGENDA-REVIEWS, CONFIGURATION AUDITS, AND DEMO -DI-E-3118 MINUTES OF FORMAL REVIEWS, INSPECTIONS AND AUDITS -DI-T-3703A COMPUTER PROGRAM CONFIGURATION ITEM -DI-T-5472 SYSTEM TEST AND VERIFICATION PLAN		RECOMMEND REVIEW TO ENSURE REQUIRED FORMAT IS COMPATIBLE WITH E.D.P. PROCESSES.

SUPPORTABILITY AND LOGISTIC SUPPORT ANALYSIS

SOURCE DOCUMENT	APPLICATION	DELIVERABLES	REFERENCE PARAGRAPH	RECOMMENDATION
AR-21C GROUND SUPPORT EQUIPMENT SELECTION, DESIGN, APPROVAL, ORDERING, DELIVERY	PREScribes PROCEDURES, TERMS, AND CONDITIONS GOVERNING THE SELECTION, DESIGN, APPROVAL, ORDERING, DELIVERY AND LOGISTICS SUPPORT FOR GSE.	-UDI-E-21001E DATA RECOMMENDATION, GROUND SUPPORT EQUIPMENT -UDI-S-21004C ILLUSTRATIONS, GSE -UDI-P-21006D DATA, INSTALLATION GSF	3.0	RECOMMEND FORMAT AND CONTENT OF DID'S BE NEGOTIATED DURING CDRL NEGOTIATIONS.
NAVAIR INSTRUCTION 4790.4A MAINTENANCE PLAN PROGRAM	DESCRIBE NAVAIR MAINTENANCE PLAN PROGRAM FOR AIRCRAFT, AIRBORNE WEAPONS, TARGETS, ARMAMENT AND GSE.	MAINTENANCE PLAN, PARTS I, II AND III	ALL	RECOMMEND POSSIBLE AMENDMENT TO ALLOW FOR E.D.P. TRANSMISSION OF DATA.
AFSCP 800-3 A GUIDE FOR PROGRAM MANAGEMENT	DESCRIBES THE GENERAL CONSIDERATIONS INVOLVED IN MANAGING THE ACQUISITION OF A SYSTEM.	NONE	CHAPTER 16	REWRITE CHAPTER 16 TO IMPLEMENT POLICY TO ALLOW FOR E.D.P. TRANSMISSION OF DATA. THIS AFSCP REFERENCES TWO (2) ADDITIONAL DOCUMENTS WHICH WILL REQUIRE COMPLETE REVISION AFSCR 310-1 "MANAGEMENT OF CONTRACTOR DATA" AND AFR-310-1 "MANAGEMENT OF CONTRACTOR DATA".

SUPPORTABILITY AND LOGISTIC SUPPORT ANALYSIS

SOURCE DOCUMENT	APPLICATION	DELIVERABLES	REFERENCE PARAGRAPH	RECOMMENDATION
AR-30A INTEGRATED LOGISTIC SUPPORT REQUIREMENTS FOR AERONAUTICAL SYSTEMS AND EQUIPMENT	THE WRITTEN VEHICLE THROUGH WHICH THE NAVY'S ILS POLICY IS APPLIED TO THE ACQUISITION OF AERONAUTICAL WEAPONS SYSTEMS AND EQUIPMENT.	68 POTENTIAL DATA ITEM DESCRIPTIONS	VOL II AND RELATED APPENDICES	DELIVERABLES ARE DEFINED IN VOL II IN TERMS OF TYPE AND CROSS LEVEL CONTENT. A MEDIA FOR THESE DELIVERABLES IS NOT MENTIONED. WHEN MENTION IS MADE OF DELIVERABLES THE COMMON PHRASE IS "...DATA REQUIREMENTS, THEIR DISTRIBUTION AND DELIVERY SHALL BE DEFINED IN THE CDRL." (DD-1423) IT IS RECOMMENDED THAT THE CONTENT AND FORMAT OF THE DATA ITEM DESCRIPTIONS (DID'S) BE FINALIZED DURING CDRL NEGOTIATIONS.
DOD-STD-480A CONFIGURATION CONTROL ENGINEERING CHANGES, DEVIATIONS AND WAIVERS	DELINEATES CONFIGURATION CONTROL PROCEDURES AND PROVIDES INSTRUCTIONS FOR PREPARING/SUBMITTING INFORMATION.	DI-E-5486 CERTIFICATE OF ACCEPTANCE UDI-E-22167B DESCRIPTION, FUNCTIONAL BASELINE	4.6.1.2 4.6.1.3	4.6.1.2 SPECIFIES USE OF DD1692, 1692-1, and DD1692-2 4.6.1.3 SPECIFIES USE OF DD1692-3, 1692-4, AND 1692-5 THE ABOVE ARE FOR CLASS 1 ECP 4.6.2.(B) REQUIRES USE OF DD1692 FOR GOV. APPROVAL OF CLASS II ECP'S 4.8.7.1.2 REQUIRES USE OF DD1695

SUPPORTABILITY AND LOGISTIC SUPPORT ANALYSIS

SOURCE DOCUMENT	APPLICATION	DELIVERABLES	REFERENCE PARAGRAPH	RECOMMENDATION
DOD-STD-480A (Cont)			Fig. 1	LIFE CYCLE APPLICATION OF DD FORM 1692
				RECOMMEND REVISION OF PARA. 4.6.1.2, 4.6.1.3, 4.6.2(B), 4.8.7.1.2 AND FIG. 1 TO ALLOW FORMAT GENERATED BY E.D.P. TO BE UTILIZED.
			APP. A-D INSTRUCTIONS FOR COMPLETING FORMS.	REVISE APPENDICES A THRU D TO ALLOW FOR E.D.P. TRANSMISSION OF DATA.
MIL-STD-2074 (AS) FAILURE CLASSIFICATION FOR RELIABILITY TESTING	ESTABLISHES CRITERIA FOR CLASSIFICATION OF FAILURES DURING RELIABILITY TEST	DI-R-2115A FAILURE CLASSIFICATION, FAILURE REPORTS	NONE	NONE, LEAVE AS IS.
MIL-D-8706B DATA AND TESTS, ENGINEERING CONTRACT REQUIREMENTS FOR AIRCRAFT WEAPONS SYSTEM	EMBODIES THE REQUIREMENTS FOR ENGINEERING DATA TO BE FURNISHED.	NONE	TABLE 1	QUANTITIES, DISTRIBUTION, SUBMITTAL DATES AND ACTION REQUIRED ON DATA-REVISE TO ALLOW FOR E.D.P. AS AN ACCEPTED MEDIA OF TRANSMISSION.
			PARA. 3.3	REVISE 3.3 TO INCLUDE E.D.P. MEDIA OF TRANSMISSION.

TECHNICAL PUBLICATIONS			
DOCUMENT	DESCRIPTION/ APPLICATION	CURRENT DELIVERABLE	SPECIFIC REFERENCE TO DELIVERABLE
			REQUIRED CHANGE
DAR 7-104.62	Material Inspection and Receiving Report DD FORM 250	Typed Forms DD 250	Para 1-401, 1-701
			Revise para 1-401, 1-407 for digitized data. Update other paragraphs as required for digitized data.
DD FORM 1423	Contract Data Requirements List - Handbooks	Manuals, Reports, and Related Publications	Blocks 4 and 14 Add information for digitized delivery of all publications in blocks 4 and 14.
DD FORM 1423	Contract Data Requirements List - Handbooks	Copies or Repro	Block 14 Add information for digitized manuals to Block 14.
DI-E-6120A	Support Equipment Illustrations	Data Sheets Repro Copy	Para 10.3 Add information for digitized delivery of illustrations. Update other paragraphs as required for digitized illustrations.
DI-M-2052	Technical Manual Status Report	Typewritten Copy 8-1/2 x 11 inch	Para 10.2 Change Para 10.2 for digitized data.
DI-M-3401	Technical Order Publications Plan	Publications Plan	None Add information for digitized delivery of plan.
DI-M-3402A	Technical Order Status and Schedules	None	None Add information for digitized delivery of report.
DI-M-3403B	Explosive Ordnance Disposal Procedure	Data	Para 7.1 Add information for digitized delivery of data.
DI-M-3405A	CFAE/CFE Notices	None	None No change required. No delivery information.

DOCUMENT	DESCRIPTION/ APPLICATION	TECHNICAL PUBLICATIONS		SPECIFIC REFERENCE TO DELIVERABLE	REQUIRED CHANGE
		CURRENT DELIVERABLE			
DI-M-3407B	Technical Order	None	None	None	No change required. No delivery information.
DI-M-3408	Validation Record	None	None	None	Add information for digitized delivery of record.
DI-M-3413	Technical Publications for Development Program	None	None	None	Add information for digitized delivery of technical manuals or data.
DI-M-6157	Advanced Development Program Publications	None	None	None	Add information for digitized delivery of technical publications.
MIL-C-27278B	Flight Crew Checklist	Printed Copy	Para 3.2, 3.6, 5.6	Para 3.2, 3.6, 3.6.5.6, and 5.1. Update other paragraphs as required for digitized manuals.	Add digitized manuals to 3.2, 3.6.5.6, and 5.1. Update other paragraphs as required for digitized manuals.
MIL-C-81222C	Flight Crew Checklist: Preparation of	Reproducible (Camera) Copy, Board Art, or Negatives	Para 3.3.1, 3.4, 4.2, 5.1, 6.3.1	Change Para's 3.3.1, 3.4, 4.2, 5.1 and 6.3.1 for digitized data. Update other para's for digitized data, as required.	Change Para's 3.3.1, 3.4, 4.2, 5.1 and 6.3.1 for digitized data. Update other para's for digitized data, as required.
MIL-C-9927A	Organizational Maintenance Checklists	Packaging	Para 5.1	Add digitized manuals to 5.1. Update other paragraphs as required for digitized manuals.	Add digitized manuals to 5.1. Update other paragraphs as required for digitized manuals.
MIL-L-7976C	Technical Manual Data Cards and List for Contractor Furnished Equipment and Accessories	IMDC - Typed on NATSF Card form 5600/214. IMDC - Not specified.	Para 3.8 and 5.1	Change Para's 3.8 and 5.1 to include digitized data. Update other para's as required for digitized data.	Change Para's 3.8 and 5.1 to include digitized data. Update other para's as required for digitized data.
MIL-L-8031D	List of Applicable Publications	Repro Copy Mechanized Repro Packaging	Para 3.1 Para 3.1.1 Para 5.1	Add digitized manuals to 3.1, 3.1.1, and 5.1. Update other paragraphs as required for digitized manuals.	Add digitized manuals to 3.1, 3.1.1, and 5.1. Update other paragraphs as required for digitized manuals.

TECHNICAL PUBLICATIONS			
DOCUMENT	DESCRIPTION/ APPLICATION	CURRENT DELIVERABLE	SPECIFIC REFERENCE TO DELIVERABLE
			REQUIRED CHANGE
MIL-M-22202C	Aircraft Cross Servicing Guide	Manuscript with repro art, Repro Copy, or Negatives Packaging	Para 3.1 Add digitized manuals to 3.1 and 5.1. Update other paragraphs as required for digitized manuals.
MIL-M-23618F	Periodic Maintenance Requirements Manual: Preparation of	Preliminary Manuscript Copy, Reproducible Copy, Camera-Ready Copy, Microfilm, or Printed Copy	Para 3.1.2, 3.1.2.1, 3.1.2.2, 3.1.2.3, 5.1.1, 5.1.2, and 5.2 to include 3.1.2.3, 5.1.1, 5.1.2, 5.2 digitized data. Update other paragraphs as required for digitized data.
MIL-M-38384A	Nonnuclear Weapon Delivery	Volumes Packaging Ordering Data	Para 3.2 Para 5.1 Para 6.2 Add digitized manuals to 3.2, 5.1, and 6.2. Update other paragraphs as required for digitized manuals.
MIL-M-38413B	Air Refueling	Manuals Packaging	Para 3.3 Para 5.1 Add digitized manuals to 3.3 and 5.1. Update other paragraphs as required for digitized manuals.
MIL-M-38769B	Work Unit Code	Repro copy, Negatives, Printed Copy Punched Cards Binders Ordering Data	Para 3.1, 6.2.b Para 3.1, 3.2 Para 3.3 Para 6.2.c Add digitized manuals to 3.1, 3.2, 3.3, 6.2.b and 6.2.c. Update other paragraphs as required for digitized manuals.
MIL-M-38778A	General Requirements, Checklists	Printed copy	Para 3.6 Add new para for digitized manuals.
MIL-M-38780A	Nondestructive Inspection Packaging		Para 5.1 Add digitized manuals to 5.1. Update other paragraphs as required for digitized manuals.

TECHNICAL PUBLICATIONS				SPECIFIC	
DOCUMENT	DESCRIPTION/ APPLICATION	CURRENT DELIVERABLE	REFERENCE TO DELIVERABLE	REQUIRED CHANGE	
MIL-M-387810	Munitions Storage, Manuals, Checklists, and Data	Repro Copy and Negatives Source Data Packaging	Para 3.1 Para 3.1.1 Para 5.1	Add digitized manuals to 3.1, 3.1.1, and 5.1. Update other paragraphs as required for digitized manuals.	
MIL-M-387848	General Style and Format	Manuscript Camera Ready Copy Acquisition Req. Packaging	Para 3.2.1 Para 3.2.2 Para 6.2.1 Para 5.1.1, 5.1.2	Add digitized manuals to 3.2, 5, and 6.2.1. Update other paragraphs as required for digitized manuals.	
MIL-M-387894	Overhaul and Overhaul with IPB	Packaging	Para 5.1	Add digitized manuals to 5.1 and 6.2. Update other paragraphs as required for digitized manuals.	
MIL-M-38790	General Requirements, Printing	Negatives Repro Assembly Sheets Printed Copy	Para 3.1 Para 3.2 Para 3.3	Replace with new spec governing digitized manuals.	
MIL-M-38793	Calibration Procedures	Packaging	Para 5.1	Add digitized manuals to 3.1 and 5.1. Update other paragraphs as required for digitized manuals.	
MIL-M-387958	Corrosion Control	Manual for Coordination Packaging	Para 4.2 Para 5.1	Add digitized manuals to 4.2 and 5.1. Update other paragraphs as required for digitized manuals.	
MIL-M-38797	Operation and Maintenance Packaging	Packaging Ordering Data	Para 5.1 Para 6.2	Add digitized manuals to 5.1 and 6.2. Update other paragraphs as required for digitized manuals.	

TECHNICAL PUBLICATIONS

DOCUMENT	DESCRIPTION/ APPLICATION	CURRENT DELIVERABLE	SPECIFIC REFERENCE TO DELIVERABLE	REQUIRED CHANGE
MIL-M-38807A	Illustrated Parts Breakdown	Packaging	Para 5.1	Add digitized manuals to 5.1. Update other paragraphs as required for digitized manuals.
MIL-M-5096D	Inspection and Maint Req, Work Cards, Insp and Lube Req., Flight Checklists, Charts	Repro Copy	Para 3.2	Add new para for digitized manuals.
MIL-M-5920D	Basic Weight Checklist and Loading	Packaging	Para 5.1	Add digitized manuals to 5.1 and 6.4. Update other paragraphs as required for digitized manuals.
MIL-M-63018A	Nonnuclear Explosive Ordnance Disposal	Packaging	5.1	Add digitized manuals to 5.1 and 6.2. Update other paragraphs as required for digitized manuals.
MIL-M-6675B	Intermediate Maintenance	Packaging	Para 5.1	Add digitized manuals to 5.1 and 6.2. Update other paragraphs as required for digitized manuals.
MIL-M-7298C	Commercial Equipment Manuals	Commercial Manual	Para 1.1.2, 3.1, 3.1.1, 3.2.1, 3.2.2.1.d	Add digitized manuals to 1.1.2, 3.1, 3.1.1, 3.2.1, 3.2.2.1.d, 3.2.2.1.6, 3.2.2.1.7, 3.2.3.d, 5.2, 6.2, and 6.3. Update other paragraphs as required for digitized manuals.
MIL-M-7700C	Flight Manuals	Repro Copy Negatives and Printing Loose Leaf Ordering Data None (See MIL-M-38784)	Para 3.2.2.1.6 Para 3.2.2.1.7, and 6.3 5.2, 6.2 Para 3.2.3.d Para 6/3	Add digitized manuals to 6.2. Update other paragraphs as required for digitized manuals.

TECHNICAL PUBLICATIONS

DOCUMENT	DESCRIPTION/ APPLICATION	CURRENT DELIVERABLE	SPECIFIC REFERENCE TO DELIVERABLE	REQUIRED CHANGE
MIL-M-81203A	Validation and Verification	Validation Plan Certification Report Manuscript or Repro Copy	Para 3.2.2 Para 3.4, 3.6.4 Para 3.5.2	Add digitized manuals to 3.2.2, 3.4, 3.5.2, 3.6.4, and 6.2. Update other paragraphs as required for digitized manuals.
MIL-M-81310C	Airborne Weapons/Stores Loading Manuals	(See MIL-M-38784)	Para 5.1 (This Spec)	Change Para 5.1 to include digitized data.
MIL-M-81754A	Weapons System Technical Documentation List, Preparation of.	Manuscript Camera Ready Copy	Para 3.1.2 Para 5.1	Para 3.2.1 would require change for digitized output. Add new para 5.1 for digitized manual.
MIL-M-81834A	Aircraft Tactical Manuals: Preparation of	Reproducible Copy, Negative, or Printed Copies	Para 3.1, 5.1, 6.2.1	Change Para 3.1, 5.1 and 6.2.1 to include digitized data. Update other paragraphs for digitized data as required.
MIL-M-81927A	General Style and Format Work Package Manuals	Reproducible Copy	Para 3.6.1, 3.6.2, 5.1 thru 5.6, 6.2.1, 6.3.1	Change para's 3.6.1, 3.6.2, 6.1 thru 5.6, 6.2.1 and 6.3.1 for digitized data. Update other para's as required for digitized data.
MIL-M-81928A	Aircraft and Aeronautical, Equipment Maintenance, Work Package Format, Technical Manuals	(See MIL-M-81927A)	Para 5.1 (This Spec)	Add new paragraph 5.1, for digitized manual. Update other para's as required for digitized data.
MIL-M-81929A	IPB, Work Package Format Technical Manual	(See MIL-M-81927A)	Para 3.3.4.2, 5.1 (This spec)	Para 3.3.4.2 no cover would be required for digitized manuals. Add new para 5.1 for digitized manual. Update other para's as required for digitized data.

TECHNICAL PUBLICATIONS

DOCUMENT	DESCRIPTION/ APPLICATION	CURRENT DELIVERABLE	SPECIFIC REFERENCE TO DELIVERABLE	REQUIRED CHANGE
MIL-M-83495	Organizational Maintenance Manual Set	Packaging	Para 5.1	Add digitized manuals to 5.1. Update other paragraphs as required for digitized manuals.
MIL-M-85025A	NATOPS Flight Manual: Preparation of and Classified Supplements to copy, reproducible NATOPS Flight Manuals.	Manuscript Copy (for review, manuscript to copy, reproducible copy, negatives or printed copies)	Para 5.1.1., 5.1.2, 5.1.3, 3.4.1, and 3.4.2	Change para's 3.4.1, 3.4.2, 5.1.1, 5.1.2, 5.1.3 for digitized data. Update other para's for digitized data, as required.
MIL-M-85337	Validation Plan	Typewritten Copy	Para 3.3.5.2	Delivery/Approval is specified, format not specified.
MIL-M-85337	Validation Certificate	Typewritten Form	Para 3.3.5.7	Change would be required to allow for digitized version of validation certificate, vice paper copy.
MIL-M-85337	Verification Plan	Typewritten Copy	Para 3.3.6.3	Change may be required in submission of planning data card (para 3.3.6.3.e), to allow for digitized data.
MIL-M-85337	Verification Discrepancy Disposition Record. (Verification Disposition Report) (Verification Incorporation Certificate)	Typewritten/ handwritten form	Para 3.3.6.2.f., 3.3.6.5	Changes required to allow for digitized version of these documents, vice printed copy.
MIL-M-85337	Quality Assurance Program Plan	Typewritten Copy	Para 3.1.1.2	Change required to allow digitized delivery. Delivery/ approval specified, format not specified.

TECHNICAL PUBLICATIONS			SPECIFIC	
DOCUMENT	DESCRIPTION/ APPLICATION	CURRENT DELIVERABLE	REFERENCE TO DELIVERABLE	REQUIRED CHANGE
MIL-M-85383	Aircraft Structure Repair, Corrosion Control, and NDI, Work Package Format Manuals.	(See MIL-M 81427A)	Para 5.1 (This Spec)	Add new paragraph 5.1 for digitized manual. Update other paragraphs as required for digitized data.
MIL-M-87158	Aircraft Battle Damage Repair	Packaging	Para 5.1	Add digitized manuals to 5.1 and 6.2.
MIL-M-98548	Structural Repair	Packaging	Para 5.1	Add digitized manuals to 5.1. Update other paragraphs as required for digitized manuals.
MIL-M-9901A	Tapes and Cards	Packaging: Manuals Tapes Cards	Para 5.1 Para 5.2 Para 5.3	Add digitized manuals to 5.1 and 5.3. Tapes will not be digitized. Update other paragraphs as required for digitized manuals.
MIL-M-9977G	Munitions Loading Manuals and Checklists	Packaging	Para 5.1	Add digitized manuals to 5.1. Update other paragraphs as required for digitized manuals.
MIL-M-9994B	Operation and Maintenance (Trainers)	Packaging	Para 5.1	Add digitized manuals to 5.1 and 6.2. Update other paragraphs as required for digitized manuals.
MIL-M-73848	CFAE/CFE Notices	Repro Copy Packaging	Para 3.1 Para 5.1	Add digitized notices to 3.1 and 5.1. Update other paragraphs as required for digitized CFAE/CFE notices.
MIL-I-38804A	Preparation of IC10s	Reproducible Copy & Printed Copy. Printed copy delivered with kit.	Para 3.7, 3.7.1, 3.7.2, 5.2, 6.4q, 3.7.6	Change to reflect documents supplied in the form of digitized data.

TECHNICAL PUBLICATIONS			
DOCUMENT	DESCRIPTION/ APPLICATION	CURRENT DELIVERABLE	SPECIFIC REFERENCE TO DELIVERABLE
NAVAIR 00-25-100	Rapid Action Changes (RAC), including Interim Rapid Action Changes	IRAC-Transmitted Message. RAC - Reproducible Copy	WP 005 00 of NAVAIR 00-25-100
TO 00-5-1	Air Force TO System	Pack up data, commercial manuals, contractor data (source data), multiple copies of preliminary manuals, technical order page supplements (TDPS)	Para 2-8, 2-10, Change to reflect documents supplied in the form of digitized data. 2-14, 2-16, 4-1a, 4-4, 4-5
TO 00-5-1	Air Force TO System	Repro copy for publication review Post-publication review AFSC form 11 Validated manuals Manual delivery concurrent with equipment Verification plan (TDMA) Technical publication development management plan Publishing technical manuals	Para 3-4 Para 3-5 Para 3-6 Para 3-8 Para 3-8b, 3-9f(3) Para 3-8C Para 3-9
TO 00-5-15	Air Force TCIO System	Instructions, Lists, Drawings etc. to be packaged as part of TCIO kits.	Para 5-1k to m, Para 5-7a(b)

TRAINING

DOCUMENT	DESCRIPTION/APPLICATION	CURRENT DELIVERABLE DOCUMENT	SPECIFIC DELIVERABLE DOCUMENT REFERENCE	REQUIRED CHANGE
MIL-STD-13798	Contract Training Programs			
		Training and Training Equipment Plan	paragraph 5.5.1	No constraints in paragraph Reference DI-H-7066
		Training Course Proposal	paragraph 5.5.2	No constraints in paragraph Reference DI-H-7067
		Task and Skill Analysis Report	paragraph 5.5.3	No constraints in paragraph Reference DI-H-7068
		Training Analysis	paragraph 5.5.3.1	" "
		Training Course Curriculum Outlines	paragraph 5.5.4	No constraints in paragraph Reference DI-H-7069
		Option 1	paragraph 5.5.4.1	" "
		Option 2	paragraph 5.5.4.2	" "
		Instructor/Lesson Guides, Training Course	paragraph 5.5.5	No constraints in paragraph Reference DI-H-7070
		Student's Training Course Guide	paragraph 5.5.6	No constraints in paragraph Reference DI-H-7071
		Audiovisual Aids, Master Reproducibles and Review Copies for Training Equipment and Training Courses	paragraph 5.5.7	"Projection-Ready copies" will be delivered as computer Graphics. Reference DI-H-7072

TRAINING

DOCUMENT	DESCRIPTION/APPLICATION	CURRENT DELIVERABLE DOCUMENT	SPECIFIC DELIVERABLE DOCUMENT REFERENCE	REQUIRED CHANGE
MIL-STD-1379B	Contract Training Programs			
		Audiovisual Aids Index for Training	paragraph 5.5.8	No constraints in paragraph Reference DI-H-7073
		Test for Measure- ment of Student Achievement	paragraph 5.5.9	No constraints in paragraph Reference DI-H-7074
		Student and Train- ing Course Evalua- tion Forms	paragraph 5.5.10	No constraints in paragraph Reference DI-H-7075
		Instructor Utiliza- tion Handbook for Simulation Equipment	paragraph 5.5.11	Reference DI-H-7076
		On-Job-Training (OJT) Handbook	paragraph 5.5.12	Reference DI-H-7077
		Conference Agenda	paragraph 5.5.13	No constraints in paragraph Reference DI-H-7088
		Conference Minutes	paragraph 5.5.14	Delete "sheets" Reference DI-H-7089
		Technical Hands-On Training System	paragraph 5.5.15	Reference DI-H-7078
		Personnel Reference Profiles	paragraph 5.5.16	No constraints in paragraph Reference DI-H-7091
		Training Path System Documentation	paragraph 5.5.17	Charts will be delivered as computer graphics Reference DI-H-7090

TRAINING

DOCUMENT	DESCRIPTION/APPLICATION	CURRENT DELIVERABLE DOCUMENT	SPECIFIC DELIVERABLE DOCUMENT REFERENCE	REQUIRED CHANGE
MIL-STD-1379B (Continued)				
		Factory Training Curriculum Materials	paragraph 5.5.18	No constraints in paragraph Reference DI-H-7093
		Curriculum and Instructional Media Materials	paragraph 5.5.19	Transparencies will be delivered as computer graphics Reference DI-H-7092
MIL-STD-1379B	DIDs			
DI-H-7066	Training and Training Equipment Plan	Same as Column 2		No constraints
DI-H-7067	Training Course Proposal	"		"
DI-H-7068	Task and Skill Analysis Report	"	paragraph 10.3	Charts and illustrations will be delivered as computer graphics
DI-H-7069	Training Course/ Curriculum Outline	"	paragraph 10.1	Deliverable will be by computer
DI-H-7070	Instructor/Lesson Guides Training Course	"		No constraints
DI-H-7074	Test for Measurement of Student Achievement	"	paragraph 10.1	Deliverable will be by computer
DI-H-7075	Student and Training Course Evaluation Forms	"		No constraints
DI-H-7076	Instructors Utilization Handbook for Simulation Equipment	"	paragraph 10.14	Reproducible copy obsolete term

TRAINING

DOCUMENT	DESCRIPTION/APPLICATION	CURRENT DELIVERABLE DOCUMENT	SPECIFIC DELIVERABLE DOCUMENT REFERENCE	REQUIRED CHANGE
MIL-STD-1379B (Continued)				
DI-N-7077	On-Job-Training Handbook	"	paragraph 10.1	
DI-N-7078	Technical Hands-On Training System Packets	"	paragraph 10.1- 10.3	Delete paper size, type and method of productions etc.
DI-N-7088	Conference Agenda	"		No constraints
DI-N-7089	Conference Minutes	"		"
DI-N-7090	Training Path System	"		"
DI-N-7091	Personnel Performance Profiles	"		"
DI-N-7093	Factory Training Curriculum Materials	"		"
MIL-T-23991E	Training Devices, Military; General Spec	"		(1st level reference to pri- mary specification) No Constraints

TRAINING

DOCUMENT	DESCRIPTION/APPLICATION	CURRENT DELIVERABLE DOCUMENT	SPECIFIC DELIVERABLE DOCUMENT REFERENCE	REQUIRED CHANGE
MIL-T-4782C	Transparencies, Technical Training	"		Major rewrite required
MIL-T-81821	Trainers, Maintenance, Equipment and Services	"	paragraph 3.4.9.11 and 3.4.9.14	Rewrite paragraphs because of new requirements by computer
DI-W-7092	Curriculum and Instruc- tional Media Materials	"	paragraph 10.4.3.1	Correct reference to cassettes
DI-W-7071	Students Training Course Guide	-	paragraphs 10.2.2 & 10.4	Delete reference to "note taking sheets."
			paragraph 10.5	Delete references to paper size and type.
			paragraph 10.7	Delete reference to size require- ment of pictures and hard copy requirement of AV aids.
			paragraph 10.9 through 10.9.2	Delete requirement for Note Taking Sheets.
			Paragraph 10.10	Needs rewrite to provide alter- nate means for instructor initials and date for achieve- ment verification.
			paragraph 10.11	Needs to remove the reference to binding.
			paragraph 10.12	Cannot use "full-blown foldout." The last sentence does not apply to C.A.S. With Diagram Sheets on C.A.S, students cannot use them as worksheets.

TRAINING

DOCUMENT	DESCRIPTION/APPLICATION	CURRENT DELIVERABLE DOCUMENT	SPECIFIC DELIVERABLE DOCUMENT REFERENCE	REQUIRED CHANGE
DI-M-7071 (Continued)	Student Training Course Guide		paragraph 10.13b	<p>Rewrite because CALS is "instruction on a computer"</p> <p>Remove reference to "issuing" of materials to students. Duplicating, covering and binding of materials in now obsolete.</p> <p>Also, materials no longer "become the property of the individual student" as stated in the last sentence of 10.13.</p> <p>Figure 2 (Note-Taking sheet) to be deleted.</p> <p>Figure 3 needs alteration in lieu of date and instructor initials for verification.</p> <p>DID probably will require a total rewrite depending on the state-of-the-art for use and transmitting of video and pictures in relationship to their computer usage.</p> <p>DID talks of 16mm film, 35mm slides, transparencies, wall charts, minimum viewing distance etc that would become obsolete with CALS.</p>
DI-M-7072	Audiovisual Aids Master Reproducibles and Review Copies of Training Equipment and Training Courses			

TRAINING

DOCUMENT	DESCRIPTION/APPLICATION	CURRENT DELIVERABLE DOCUMENT	SPECIFIC DELIVERABLE DOCUMENT REFERENCE	REQUIRED CHANGE
MIL-T-81821 (Continued)				
DI-N-7073	Audiovisual Aids Index for Training Equipment and Training Courses	"		DID could be rewritten for the more simplified needs of CALS. With all AV going on a computer type system no cataloging of volumes of slides, transparencies required.
DI-N-7074	Tests for Measurement of Student Achievement	Same as Column 2	paragraph 10.1	Delete reference to paper size and type.
			paragraph 10.6.3 through 10.6.3.3	May have to be deleted if CALS is used to administer the exam- inations depending on the capa- bilities of the system program.
			paragraph 10.6.4	Needs to have examples adjusted to reflect the limitation of the system (e.g. "circle T...circle F") if CALS is to be used to ad- minister the test.
			paragraph 10.6.6	Labeling type questions may not be within the capability of the CALS system.
MIL-T-25711A	Training Development and Support Plan	"		No constraints
MIL-T-25713A	Task Listings Report	"		"
MIL-T-25715A	Objectives Hierarchy Report	SBO & IO Report		Hierarchies may present problem

TRAINING

DOCUMENT	DESCRIPTION/APPLICATION	CURRENT DELIVERABLE DOCUMENT	SPECIFIC DELIVERABLE DOCUMENT REFERENCE	REQUIRED CHANGE
MIL-T-25720A	Media Selection and Syllabus Report	MMTS & Syllabus		No constraints
MIL-T-25722A	Lesson Specification Report	Same as Column 2		Graphics to be computer graphics. ATF sheet may require reformatting (See p. 7 of 13)
MIL-T-25724A	Student Training Materials	Student Materials	10.3	Format and quantities of deliver- ables should be changed to suit system.
MIL-T-25727A	Implementation Plan Report	Implementation Manual		Reference MIL-T-25/11A

F/A-18 NAVY ILS PLANNING

Contract N00019-83-C-0272

<u>Document</u>	<u>Description/Application</u>	<u>Current Deliverables</u>	<u>Specific Deliverable Reference</u>
CDRL L001 UDI-P-21039	Plan, Support Site Activation. Conduct Planning/Analysis of all ILS support facilities elements, to support the F/A-18 total weapons system at a particular customer site to include interim workarounds.	20 Site Activation Plans. Average 130 pages each plan. 6 mo. updates.	CDRL - Delete last two sentences relating to submit/distribute copies. Change to read, "Planning Data and update may be transmitted by electronic means." DID - Paras. 10.6,d.(8), 10.8,c. & c(2). delete "Manuals" and substitute the word "Data".
CDRL D003 UDI-L-21012	Integrated Logistic Support Plan (ILSP) conduct planning/analysis of all ILS support elements to determine F/A-18 sub-system material support capability for the customer.	5 Subsystem ILS Plans. Average 40 pages each plan. 6 mo. updates.	CDRL - Sentence one, delete "letter of transmittal" and substitute to read "electronic means". DID - Revision of paras. 10.1 and 10.2 required to delete all references to "documents", "plan under one cover", "loose-leaf form, separately bound" etc., to read "Plan data and updates may be transmitted by electronic means."
CDRL J001 UDI-A-23864A	Report Program/Project Review (Integration Maintenance Transition Work Pkg.) Conduct F/A-18 planning/analysis of all ILS support elements at a site to determine transition capability of the customer at the "I" and "D" levels of maintenance for AVE and SE systems.	10 subsystem groups in each level of maintenance transition data package. "I", "D", & "SE" level 2,500 pages average each data package. Quarterly updates and 6 mo. reissues.	CDRL - No changes required. DID - Revise para. 3 to delete reference to "typewritten material on 8" x 10-1/2" white paper" etc., and substitute to read "report and updates may be transmitted by electronic means."

NOTE: A general statement should be included to permit the use of "computer conferencing," "electronic blackboards" and an "electronic mail" system between MCAIR and customer.

F/A-18 NAVY ILS PLANNING (Cont.)
Contract N00019-83-C-0272

<u>Requiring Document</u>	<u>Description/Application</u>	<u>Deliverable Document</u>	<u>Specific Deliverable Reference</u>
CDRL Exhibit D Seq. No. D002. UDI-R-21015	A monthly report covering organization, problem definition, status and history of ILS activities, composed of about 300 pages of which about 70 are revised monthly. Provided to 8 Navy and 33 MCAIR addressees.	ILS Control Manual, MCAIR Report MDC A3941	<ol style="list-style-type: none"> 1. Change CDRL, DID and ILS-DS to specify that report shall be suitable for maintenance, transmission and remote display using electronic means. 2. Change CDRL distribution to specify remote customer terminal to receive report. 3. Specify in CDRL frequency/date of file update and period of access to report by remote sites.

AV-8B/TAV-8B ILS PLANNING

(Contract N00019-80-C-0655, Pilot Production)

<u>Document</u>	<u>Description/Application</u>	<u>Current Deliverables</u>	<u>Specific Deliverable Reference</u>
UDI-L-21012 (Integrated Logistic Support Plan)	The ILS Plan identifies MCAIR and Navy effort required to develop ILS resources from FSD to Navy Support Date (NSD)	ILS Plan updated as required.	ILS Detail Spec. 30A-31 CDRL Sequence No. C001
<p>This document could be transmitted electronically. However, there are extensive graphic requirements required for one of the enclosures.</p>			
UDI-A-21201 (ILS Control Manual)	The ILS Control Manual is used by Navy and MCAIR management to monitor the progress and development of support resources.	AV-8B ILS Control Manual	ILS Detail Spec. 30A-31 CDRL Sequence No. C002
<p>This document could be transmitted electronically with no apparent changes.</p>			
UDI-E-21353A CFE-Repairable Item Support System	The CFE-RISS Monitors the development of logistic resources for A/C subsystems, WRAs and repairable SE.	CFE-RISS & ILS for SE Status Report	ILS Detail Spec. 30A-31 CDRL Sequence No. C005/P005
<p>This document could be transmitted electronically with no apparent changes.</p>			
UDI-P-21039 (Site Activation and Support Plan)	The SASP provides visibility of requirements and their time schedules to ensure successful site activation.	SASP	ILS Detail Spec. 30A-31 CDRL Sequence No. H001

This document could be transmitted electronically with no apparent changes.

F-18 SUPPLY SUPPORT
CDRL REQUIREMENTS

<u>DOCUMENT</u>	<u>DESCRIPTION</u>	<u>DELIVERABLE</u>	<u>AUTHORITY</u>	<u>REQUIRED CHANGE</u>
MIL-STD-1552	Data Item DI-V-2022 Provisioning Parts List Index	As Required Tape/Hard Copy	DD Form 1423 Distribution	None
MIL-STD-1552 MIL-STD-1561	Data Item DI-V-2172 Post Conference Provisioning List	As Required Tape/Hard Copy	DD Form 1423 Distribution	None
MIL-STD-1388-1	Data Item DI-V-6183A List Consolidated Ground Support Equip. (CGSEL)	Quarterly Hard Copy	DD Form 1423 Distribution	Authorize Electronic Delivery
MIL-STD-1561	Data Item DI-V-7000 Supp Provisioning Tech Documentation	As Required Tape/Hard Copy	DD Form 1423 Distribution	None
MIL-STD-1552 MIL-STD-1561	Data Item DI-V-7004 Long Lead Time Items List	As Required Hard Copy	DD Form 1423 Distribution	Authorize Electronic Delivery
MIL-STD-1552 MIL-STD-1561	Data Item DI-V-7005 Repairable Item List	As Required Tape/Hard Copy	DD Form 1423 Distribution	None
MIL-STD-1552 MIL-STD-1561	Data Item DI-V-7008 Common and Bulk Item List	As Required Hard Copy	DD Form 1423 Distribution	Authorize Electronic Delivery
MIL-STD-1552 MIL-STD-1561	Data Item DI-V-7009 Design Change Notice	As Required Tape/Hard Copy	DD Form 1423 Distribution	None
MIL-STD-1552 DoD 4100.38-M	Data Item DI-V-7016D Screening Data	As Required Hard Copy	DD Form 1423 Distribution	Authorize Electronic Delivery

F15/F4 USAF/FMS SUPPLY SUPPORT

<u>DOCUMENT</u>	<u>DESCRIPTION</u>	<u>DELIVERABLE</u>	<u>AUTHORITY</u>	<u>REQUIRED CHANGE</u>
AFPI 71-685	V-113-2/T CAGEL	Hardcopy	DD 1423	Authorize Electronic Delivery
DoD 4100-38-M MIL-STD-1552	DI-V-70160/T Provisioning/ Procurement Screening	EAM Cards Hardcopy	DD 1423	Authorize Electronic Delivery
AFPI 71-682 AFPI 71-688	V-114/1/T Delinquency Delivery Report	Hardcopy	DD 1423	Authorize Electronic Delivery
AFD 71-682	A-200/T-WR Work Load and Funds Report	Hardcopy	DD 1423	Authorize Electronic Delivery
AFR 800-12 MIL-STD-480	DI-S-3596A/7 SERD	Hardcopy	DD 1423	Authorize Electronic Delivery
MIL-STD-885 AFR 57-6	P127 (AFSL) Procurement Method Information	Hardcopy	DD 1423	Authorize Electronic Delivery
MIL-STD-1561	E-108-2 Engineering Data Cat. D Initial Logistics Support	Hardcopy	DD 1423	Authorize Electronic Delivery
AFMCH65-1 AFM 67-1	L-123-1/T Master Material Support Record	Hardcopy EAM Cards	DD 1423	Authorize Electronic Delivery

F15/F4 USAF/FMS SUPPLY SUPPORT (Cont.)

<u>DOCUMENT</u>	<u>DESCRIPTION</u>	<u>DELIVERABLE</u>	<u>AUTHORITY</u>	<u>REQUIRED CHANGE</u>
AFAD 71-685	DI-V-38/5 V-124-2 PAGE 1	Hardcopy	DD 1423	Authorize Electronic Delivery
AFAD 71-682/ DID R-117	V-300-WR/T RIB	Hardcopy	DD 1423	Authorize Electronic Delivery
AFAD 71-682 AFAD 71-685	V-301-1/WR/T Support Items List	Magnetic Tape	DD 1423	None
AFAD 71-682	V-302-WR Priced Spare Parts List	Hardcopy	DD 1423	Authorize Electronic Delivery
V-305-WR V-114-1	V-303-WR Spare Parts Delivery Information	Hardcopy	DD 1423	Authorize Electronic Delivery
MIL-STD-1552 MIL-STD-1561 OMB 22-R-323	V-304-WR/T Bulk/Common Items List	Hardcopy	DD 1423	Authorize Electronic Delivery
V-305/WR/7	V-305-WR/T Data Accumulation Transmittal Sheets	Hardcopy	DD 1423	Authorize Electronic Delivery
AFLCR57-27	V-308-WR Computation Work Sheets	Hardcopy	DD 1423	Authorize Electronic Delivery
V-309-WR	V-309-WR Notification of End Article Completion	Hardcopy	DD 1423	Authorize Electronic Delivery
AFAD 71-682	V-310-WR/7 GFP for CFE Spares	Hardcopy	DD 1423	Authorize Electronic Delivery

F15/F4 USAF/FMS SUPPLY SUPPORT (Cont.)

<u>DOCUMENT</u>	<u>DESCRIPTION</u>	<u>DELIVERABLE</u>	<u>AUTHORITY</u>	<u>REQUIRED CHANGE</u>
MIL-STD-1561A	DI-V-7000 Supplementary Provisioning Technical Documentation	Hardcopy	DD 1423	Authorize Electronic Delivery
MIL-STD-1561A	DI-V-7004 Long Lead Time Items List	Hardcopy	DD 1423	Authorize Electronic Delivery
AFR 800-26 MIL-STD-1388	DI-V-24093/M Recommended Spare Parts List (SAIP)	Hardcopy	DD 1423	Authorize Electronic Delivery
	Monthly Provisioning Data Submittal Summary Letter	Hardcopy	ASD/TAFSC(D) Letter	Authorize Electronic Delivery

F15 FMS (PEACE FOX/PEACE SUN) SUPPLY SUPPORT

<u>DOCUMENT</u>	<u>DESCRIPTION</u>	<u>DELIVERABLE</u>	<u>AUTHORITY</u>	<u>REQUIRED CHANGE</u>
MIL-STD-1561A	DI-V-7003 Short Form Provisioning Parts List	Magnetic Tape Hardcopy	DD 1423	None
MIL-STD-1561A	DI-V-7009 Design Change Notice	Magnetic Tape	DD 1423	None
MIL-STD-1561	DI-V-2172/T Post Conference Provisioning List	Hardcopy	DD 1423	Authorize Electronic Delivery
MIL-STD-1561	DI-V-3816 V-125-4/T Spare Parts Production List	Hardcopy	DD 1423	Authorize Electronic Delivery
MIL-STD-1561	DI-V-2022/T Provisioning Parts List Index (ISP)	Hardcopy	DD 1423	Authorize Electronic Delivery
AFAD 71-682 AFAD 71-685 AFAD 71-688	DI-V-3806/V-1154/7 Spare Parts/ACE Delivery Schedule 9MAF-7106)	Hardcopy	DD 1423	Authorize Electronic Delivery

AV-8B/CRMK-5/SIMULATORS/TRAINING DEVICES - SUPPLY SUPPORT

AV8B DOCUMENT	DESCRIPTION	DELIVERABLE	AUTHORITY	REQUIRED CHANGE
ILS/DS-30A-31	DI-D DI-V-2022 Index, Provisioning Parts List	Hardcopy - 1	DD Form 1423 and PRS	Authorize Electronic Delivery
ILS/DS-30A-31	DI-D-V-5169D EAM Provisioning Card Decks	EAM Cards - 1	DD Form 1423	Authorize Electronic Delivery
ILS/DS-30A-31	DI-V-7005 List, Repairable Items (RIL)	Hardcopy - 1	DD Form 1423 and PRS	Authorize Electronic Delivery
ILS/DS-30A-31	DI-V-7008 List, Common Bulk Items (CBIL)	Hardcopy - 1	DD Form 1423 and PRS	Authorize Electronic Delivery
ILS/DS-30A-31	DI-V-7009 Design Change Notice (DCN)	Hardcopy - 1	DD Form 1423 and PRS	Authorize Electronic Delivery
ILS/DS-30A-31	DI-V-7011 List, Post Conference	Hardcopy - 1	DD Form 1423 and PRS	Authorize Electronic Delivery
ILS/DS-30A-31	DI-V-7000 Supplementary Provisioning Technical Documentation	Hardcopy - 1	DD Form 1423 and PRS	Authorize Electronic Delivery
ILS/DS-30A-31	DI-V-7002 List, Provisioning Parts (PPL)	Hardcopy - 1	DD Form 1423 and PRS	Authorize Electronic Delivery
ILS/DS-30A-31	DI-V-7003 List, Short Form Provisioning Parts	Hardcopy - 1	DD Form 1423 and PRS	Authorize Electronic Delivery
ILS/DS-30A-31	DI-V-7004 List, Long Lead Time Items (LLTIL)	Hardcopy - 1	DD Form 1423 and PRS	Authorize Electronic Delivery

AV-8B/GRMK-5/SIMULATORS/TRAINING DEVICES - SUPPLY SUPPORT (Cont.)

<u>DOCUMENT</u>	<u>DESCRIPTION</u>	<u>DELIVERABLE</u>	<u>AUTHORITY</u>	<u>REQUIRED CHANGE</u>
ILS/DS-30A-31	DI-V-7016C Provisioning and Other Pre-Procurement Screening Data	Hardcopy - 1	DD Form 1423 and PRS	Authorize Electronic Delivery
ILS/DS-30A-31	DI-V-7001 Manual, Manufactures or Commercial	Hardcopy - 1	DD Form 1423 and PRS	Authorize Electronic Delivery
ILS/DS-30A-31	DI-V-7006 List, Interim Support Items (ISIL)	Hardcopy - 1	DD Form 1423 and PRS	Authorize Electronic Delivery
ILS/DS-30A-31	DI-V-7007 List, Tools and Test Equipment	Hardcopy - 1	DD Form 1423 and PRS	Authorize Electronic Delivery
ILS/DS-30A-31	UDI-V-21042A List, Support Material	Hardcopy - 10	DD Form 1423	Authorize Electronic Delivery
ILS/DS-30A-31	UDI-L-21002D List, Consolidated GSE (CGSEL)	Hardcopy - 10	DD Form 1423	Authorize Electronic Delivery
ILS/DS-30A-31	UDI-P-21354 List, Contractor Recommended Coding	Hardcopy - 1	DD Form 1423	Authorize Electronic Delivery
ILS/DS-30A-31	DI-L-2179 Master Index of Repairables (MIRL)	Hardcopy - 10	DD Form 1423	Authorize Electronic Delivery
ILS/DS-30A-31	Open ASO Items, Item Identifications	Hardcopy - 1	PRS	Authorize Electronic Delivery
ILS/DS-30A-31	NIMSR Transcripts	Hardcopy - 1	PRS	Authorize Electronic Delivery
ILS/DS-30A-31	DIA Class/ASO Managed Listing	Hardcopy - 1	PRS	Authorize Electronic Delivery

AV-8B/GRMK-5/SIMULATORS/TRAINING DEVICES - SUPPLY SUPPORT (Cont.)

<u>DOCUMENT</u>	<u>DESCRIPTION</u>	<u>DELIVERABLE</u>	<u>AUTHORITY</u>	<u>REQUIRED CHANGE</u>
ILS/DS-30A-31	Commercial Overhaul Items Listing	Hardcopy - 1	PRS	Authorize Electronic Delivery
ILS/DS-30A-31	Add Reference Number Transcripts	Hardcopy - 1	PRS	Authorize Electronic Delivery
ILS/DS-30A-31	Item Description/PCC/ DOP/SMIC/ARR/ Comp. Codes/MSD/ Repair Kit/LRC Minutes	Hardcopy - 1	PRS	Authorize Electronic Delivery
ILS/DS-30A-31	APAC 5 Count Listing	Hardcopy - 1	PRS	Authorize Electronic Delivery
ILS/DS-30A-31	Provisioned Item Order	Hardcopy - 1	PRS	Authorize Electronic Delivery
ILS/DS-30A-31	Initial Procurement Requirements List	Hardcopy - 1	PRS	Authorize Electronic Delivery
ILS/DS-30A-31	J14 Model Products	Hardcopy - 1	PRS	Authorize Electronic Delivery
ILS/DS-30A-31	NICN'S/ISN'S Used List	Hardcopy - 1	PRS	Authorize Electronic Delivery
ILS/DS-30A-31	PCPT Transcript Format	Hardcopy - 1	PRS	Authorize Electronic Delivery
ILS/DS-30A-31	PCPT Problem Summary	Hardcopy - 1	PRS	Authorize Electronic Delivery

AV-8B/CRMK-5/SIMULATORS/TRAINING DEVICES - SUPPLY SUPPORT (Cont.)

CR MK-5	DOCUMENT	DESCRIPTION	DELIVERABLE	AUTHORITY	REQUIRED CHANGE
KEM210		"A" List	Hardcopy - 6	KEM202	Authorize Electronic Delivery
KEM210		"B" List/Initial Provisioning List (IPL)	Hardcopy - 3	KEM202	Authorize Electronic Delivery
KEM210		Electronic Spare Parts List (ESPL)	Hardcopy	KEM 202	Authorize Electronic Delivery
		Part 1B, Issue 1, List A	1		
		Part 1B1, Issue 1, List B	1		
		Part 1B1, Issue 1, List C	2		
KEM210		Design Change Notice	Hardcopy - 1	KEM202	Authorize Electronic Delivery
KEM210		Part Number to NSN Cross-Reference	Hardcopy - 1	KEM202	Authorize Electronic Delivery
KEM210		Aircraft Configuration Statement	Hardcopy - 1	KEM202	Authorize Electronic Delivery
KEM210		Schedule of Spares Orders (MOSSRS)	Hardcopy - 1	KEM202	Authorize Electronic Delivery
KEM210		Family Tree Equipment Lay-Out	Hardcopy - 1	KEM202	Authorize Electronic Delivery

AV-8B/CRMK-5/SIMULATORS/TRAINING DEVICES - SUPPLY SUPPORT (Cont.)

Simulators

<u>DOCUMENT</u>	<u>DESCRIPTION</u>	<u>DELIVERABLE</u>	<u>AUTHORITY</u>	<u>REQUIRED CHANGE</u>
Contract	UDI-V-25779 Accompanying Spark Parts List (ASPL)	Hardcopy - 1	DD Form 1423	Authorize Electronic Delivery
Contract	DI-V-5275/Mod Maintenance, Test and Support Equipment List (MT&SEL)	Hardcopy - 1	DD Form 1423	Authorize Electronic Delivery

Appendix E

TWO VIEWS OF CALS EVOLUTION

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Traditional View.....	E-3
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APPENDIX E

1. TRADITIONAL VIEW OF CALS EVOLUTION: ATTITUDES, ORGANIZATIONS AND PROCEDURES MUST CHANGE IN ORDER TO ACHIEVE THE CALS OBJECTIVES

1. Serious deficiencies exist in the capability of AFLC's current systems to adequately support the USAF's wartime, as well as peacetime, logistics readiness posture. Long range Logistics Force Structure Management Systems (LFSMS) planning must incorporate, in a logical fashion, near term and ongoing modifications to data systems as well as provide guidance for the development/enhancement of systems through the 1990's. As we look toward the twenty-first century, Computer Aided Logistics Support (CALS) shows promise of overcoming many of our information problems inherent in using dissimilar information sources/media.

The last thirty years have shown major changes in the management techniques available to logisticians. These techniques have revolutionized the practice of logistics management and have brought forth the concept of "the science of logistics." Central to the development and applications of this science has been the availability of the computer. But as much as the computer has helped solve the logistics problems of the past - so too does it represent the logistics challenges of the future.

Currently, the requirements workload is manually tracked, updated, maintained, summarized and recorded for timely effective management. This involves a wide range of administrative and support operations to facilitate the identification of requirements and their integration into a total defensible force structure for AFLC. These requirements include automatic data processing, communications-electronics, command and control, equipment, manpower and other command system specific logistics needs. We believe that CALS, as a system concept, is a valid approach toward resolving management information exchange/manipulation problems.

Paper based instructions on how to operate and maintain systems have been constrained by the paper media to a rigid, fixed format. Troubleshooting instructions were procedural following a fixed sequence. The computer can handle the cross-referencing relationships for rapid access to all parts of the data base. This will permit multiple levels of detail and presentation tailored to the skill of the user. The computer can perform function such as schematic tracing and parts identification, providing dynamic troubleshooting logic, and update the data base with the results of each new use. The distinction between test equipment, maintenance aids, and training materials disappears. In the future it will be possible to have a single device and inherent software that would perform diagnostics, aiding, or training as needed. In some cases this could even be embedded in the prime equipment.

During the acquisition cycle a massive amount of technical information is generated. This information incident to design producability and supportability is presently documented via paper or microfiche. In its present form, it is extremely difficult to integrate and read and very costly to maintain. The technology to digitize this type of information is progressing very rapidly. There are already several programs wither being planned or underway in AFSC and AFLC which deal with aspects of this issue. It is imperative that we integrate these programs together, at the very least from an informational perspecitve, to assure that we are moving in the right direction and in a coordinated manner.

Organizations rus a substantial risk of failure if they look to automation froma traditional point of view, i.e., only automate what it is you have been doing. Without a solid long-range strategy and eye to eliminating the constraint that limited past practices, one may very well be on the wrong road.

Findings of the Air Force Management Analysis Group (AFMAG) on Spare Parts Acquisition, indicated that:

1. DoD directives force the Services to buy engineering drawings and associated lists in the same manner as transient management data.
2. Contractor prepared drawings are seldom subjected to an audit that would vigorously demonstrate their capability to support breakout, competitive acquisition or to justify proprietary rights claims. Physical Configuration Audit (PCA) checks to see that the item produced, not that the drawings can be used to produce the items.
3. Post Production Support (PPS) or Interim Contractor Support (ICS) are not planned for, early on, in the acquisition process. ICS usually ends with the prime contractor sole source in a catch-up mode. Data Item Descriptions (DIDs) used to buy drawings are not conducive to producing a data system to support PPS follow-on.
4. Provisioning exercises are forced and occur early under unfavorable circumstances, normally with insufficient/incomplete drawings.
5. Drawings are required to be delivered in an obsolete standard format (microfilm on aperature cards). Microfilm technology requires stringent drawing room practices no longer in use by major contractors.
6. Present DoD Policy and procedures tend to
 - a. freeze a copy of the changeable documents, cut the copy off from the parent data base, and then use it in isolation from the design activity;
 - b. cause the procurement of insufficient and obsolete drawings;
 - c. prevent AF from achieving self sufficiency;
 - d. have the contractor prepare drawings to match his internal needs without considering the future needs of the AF.

The government currently receives dimensioned engineering drawings on microfilm and undimensioned drawings on stable base material. The Engineering Data Computer Assisted Retrieval System (EDCARS) will enable the Air Force to receive engineering data in an automated format directly from contractors, as long as their system is compatible with EDCARS. EDCARS will also allow paper microfilm data to be digitized for storage and use by EDCARS. Other services already have, or will have, similar automated systems.

Contract management is a series of actions involving engineering, cost analysis, security, and procurement management expertise. Currently this process is accomplished manually but lends itself to mechanization and its currently being automated. The Contracting Laboratory has been tasked with standardization and implementation of the Automated Contract Preparations System (ACPS), and the development ADP record formats in accordance with Military Standard Contract Administration Procedures (MILSCAP) formats pursuant to DoD 4105.63M, using Standardized ACPS. The establishment of logistics requirements for contracts involves transposing logistics design goals and requirements into contractual language for inclusion in solicitations and subsequent contractual documents. The subprocess also involves an assessment of the contractor(s) capability to comply with contractual logistics requirements, the development of logistics criteria for use in contractor selection, and the establishment of appropriate liaison with the contractor(s) to ensure the contractor's proper understanding of the logistics requirements of the contract. Contract language for engineering data acquisition that has been used in the past does not prevent unforeseen problems when a contractor uses Computer Aided Design (CAD). If contractors use manual methods of design and resultant documentation, and provide such data on paper or microfilm, the Air Force can accept and use the data either using the current

manual method, or by using ECARS. Guidance is needed on how to contract for delivery of incompatible CAD systems so that the conversion to an acceptable medium does not lose content or quality of information. Furthermore, until such a time that EDCARS becomes operational, guidance is needed to allow acquisition of engineering data in a useable format even when contractors use CAD.

In the past when programs have acquired both Level 3 data and acquisition (procurement) data packages IAW MIL-STD-885 and DI-P-3472A, contractors have built the packages solely from the Level 3 data. Further acquisitions will experience a continued emphasis on the completeness of Level 3 data and its usefulness and corresponding de-emphasis on the purchase of "reprocurement packages".

Mission analysis and conceptual planning begin before the decision is made to develop and acquire a system; it is initiated with the review and analysis of a documented statement of need (SON), based upon known mission requirements. Stated requirements are evaluated from a logistics perspective. As the program progresses, board termed logistics constraints are established, the logistics strategy for the support system is defined, and the system operational concept is developed. These functions are accomplished manually. An example of a document is the Mission Element Need Statement (MENS).

Current systems support is provided by the Project Equipping and Conversion Program (K005B) and the Aerospace Vehicle and Flying Hour Program Management System (K0058) and which respectively provide peacetime Air Force Programming data on aircraft and missile equipage at unit level and programmed aircraft inventory and flying hours. These data are essential for material requirements and workload determination and subsequent AFLC logistics resources (personnel, money, and materiel programming actions). At the present, the integration of plans

and programs information into command resource aggregation is largely manual.

Data for requirements computations are gathered either manually or from automated data systems. Computation begins with a determination of the on-hand balance of assets in storage, in transit or in repair, the assets installed or in use, and the authorizations or allowances for inventory assets. Based on inventory records, additional elements are considered and/or computed through mathematical formulas to determine user supply demands, the quantity of assets which are available for repair, and those that must be condemned or replaced. Requirements for initial provisioning items entering the Air Force on new weapon systems or support equipment are computed manually. In the near term, the requirements process has been modified to improve the existing baseline, and set the stage for long-range improvement under the Requirements Data Bank (RDB) project. The RDB project will transition the process from a series of individual independent data systems to an integrated RDB.

The cost in personnel and materials, of maintaining military systems, consumes a major portion of the total defense budget. It is a natural corollary to assume that any increase in military manpower efficiency results in multiple savings of time and money. One means of improving the logistics environment is through genuine progress in optimizing the training environment.

Instructional System Development (ISD) provides a systematic, but flexible decision making process for instructional programs. It is used for planning, developing, and managing instructional programs so people acquire the knowledge, skills, and attitudes needed to do their Air Force jobs. The Air Force has adopted a model with five broad steps to describe the ISD process. These steps are:

- a. analyze system requirements
- b. define education and training requirements

- c. develop objectives and tests
- d. plan, develop and validate instructions
- e. conduct and evaluate instruction.

New instructional programs start during the conceptual development stage of a new weapon or support system and continue throughout the life cycle of the system.

Evaluations of ISD have revealed two major problem areas (1) expansion of the ratio of curriculum development time to actual classroom instruction, and (2) in practice, ISD's components are often omitted or the relationship between components essential to a truly derivative ISD process is not maintained.

To combat these problems, Lockheed Electronics Company's Computer Aid for Instructional System Development (CAISD) project is designed to provide substantial time reductions in development steps that can be automated. Essentially, CAISD is an automated system which incorporates a series of aids to help instructional developers their work. The system consists of stored basic data common to all courses, and it can adapt that data to a specific course according to preprogrammed rules. The system also provides built-in quality assurance as a result of an automated building block concept of component development. CAISD has reduced curriculum development time and costs while assuring a rigorous, exhaustive application of each step of the ISD process.

Another automated training system recently developed is the Training Analysis Support Computer System (TASCS). It was developed to speed up the training analysis and design process, while maintaining the integrity of the ISD methodology. It is a micro-computer based tool which aids the ISD designer through automated assistance. TASCS accommodates the ISD-naive or computer-naive user via interaction and automation oriented toward the subject matter with little or no knowledge beyond task expertise in the job being analyzed. TASCS is micro-computer based system using inexpensive, widely accepted hardware and software components.

The Advanced Systems Division of the Air Force Human Resources Laboratory initiated a three-phase effort to integrate and apply five human resource technologies to the weapon system acquisition process as the Coordinated Human Resource Technology (CHRT). The five technologies are human resources in design trade-offs, maintenance manpower modeling, instructional system development (training), job guide development (technical manuals), and system ownership costing. The CHRT methodology also included a consolidated data base (CDB) which services the five integrated technologies. CHRT and CDB were applied to the avionics and landing gear systems of the Advanced Medium STOL Transport (AMST) using data projected for the minimum engineering development phase.

The major categories of data stored in the consolidated data base (CDB) relate to reliability, maintainability, maintenance manpower, operations manpower, training, and job guides for both maintenance and operations, and system ownership costs. The CDB is to be used for operational and support planning after deployment. The CDB expands in detail with time as the weapon system acquisition cycle progresses. The consolidated data base is dynamic in nature representing alternatives being considered as well as baseline approaches. The CDB is designed for frequent update and expansion.

These are examples of what our training is currently pursuing, separate but parallel paths. Although the data available from LSAR is utilized in these systems it is not a uniform application and there will continue to be a lot of manual input/output using paper products.

Acquisition Logistics planning places emphasis on developing plans that direct acquisition actions toward influencing design for support, and developing plans that direct acquisition actions towards influencing designing for support, and developing support systems that are compatible with operational needs and AFLC

management systems. These functions are; Integrated Logistics Support Plan (ILSP), Program Management Plan (PMP), Test and Evaluation Master Plan (TEMP), and Computer Resources Integrated Support Plan (CRISP), accomplished manually.

The prime objective of logistics support analysis (LSA) and the resulting data is the development, acquisition, and sustaining of affordable systems and equipment which meet required readiness levels. It is projected that the LSA/LSAR process will eventually serve as the source of planning data for both design and follow-on support activities. Within the LSA process, there will be defined the engineering tasks that create the logistics data, analysis, and tradeoffs associated with design and development of the end item and its support system. An LSA data element dictionary will be established that is both compatible with the LSA task statements and the acquisition data requirements of AFLC management systems. A logical extension will be the establishment of direct links between the LSAR and AFLC data management systems to fully automate the integration of logistics management planning.

Some of the ongoing and planning enhancements for LSA and LSAR include the following:

- a. development of LSAR extract routines to interface the LSA data file with Repair Level Analysis (RLA), Life Cycle Support Cost, and Readiness models
- b. development of a routine to generate internal data, this will include records to automatically generate/validate other data, such as provisioning data, from reliability and maintainability analysis
- c. development of a breakdown parts list utilizing the parts master file and the LSA Control Numbers (LCN) structure, regardless of the assignment method used; the computer will assimilate from the file a list of parts which constitutes an assembly.

The need for a compatible automated system among defense commodity is quite evident. Currently there does not exist a joint service plan for integration of these automated efforts. Without such a plan, we will continue to purchase non-interactive data bases and their accompanying hardware. As the CALS project develops, the successful communication with compatible systems appears quite achievable.

APPENDIX E

2. FAST PACED VIEW OF CALS EVOLUTION: AN UNSTRUCTURED (AD HOC) SYSTEM WILL EVOLVE WITH FREE FORM DEMAND BASED DATA SYSTEMS

Tasking: An unstructured (Ad Hoc) system where a central or integrated distributed data base is used in free form where each user can design and acquire the data that he needs on a demand basis. Each of the extremes will be discussed from the point of view of its attributes, advantages, disadvantages, issues, technology requirements, time frame in system life cycle, etc. as well as its utility vis a vis each selected function.

This unstructured view of the weapon system data base architecture attempt to look, not at current processes understood by experienced designers, but at the w/s development process in light of data processing technology as it is exploding in the 80's. It also attempts to project data processing technology into the 21st century. It includes a view of the data base and also challenges contracting strategies that have evolved from the realities of a different era. It takes as a basic premise that weapon systems can be developed in HALF the time, HALF the cost and with quantum increases in "designed in reliability".

The technologies:

- a. Parallel processing vice serial
- b. On line archival media (optical disk or equal)
- c. Distributed communications
- d. Multi user, multi processor
- e. Graphics
- f. Multi level encryption protocols
- g. CAD/CAM/CAE
- h. Multi-machine translator protocols, i.e., GM Manufacturing Automation Protocol (MAP)
- i. Super micro processors
- j. 100MHZ speeds
- k. 100k baud rate switching devices

The strategies:

- a. DoD demands total system responsibility
- b. Distributed data base numbering architecture, i.e., FINDER or equal
- c. IR&D, CRAD and DoD labs use FINDER in laboratory technology development work
- d. Total prime/sub tier integration a requirement
- e. DoD cost accounting procedures overhauled to track direct labor, overhead and material burden
- f. DoD program managers interact with prime in developing system, i.e., drawing released authority
- g. Database layered and segmented to deal with post production support and spares breakout data visibility
- h. DoD elects to leave database with prime as long as data access service is satisfactory and meets peacetime/wartime requirements.

Scenario: There is nothing that the DoD customer needs to see and understand over and above what the developer and designer see and do as a part of the development process. The whole process is a monolithic, indivisible continuum of data processing and decisions made based on the data visibility by contractor and customer through interaction. Architecting and segmenting the database to naturally feed the process with data needed for PDR/CDR and other decision points is the foundation of this scenario.

Data Deliverables: Data deliverables changes to data visibility timed to customer and contractor decision points in the process. All technical information required to deploy and operate/maintain a weapon system exists in some form in the database. The trick is to identify those requirements and provide for visibility of the data supporting the need at the time the customer requires the data. This applies to a spectrum

from process information required to modify or manufacture a part, through technical information required in some remote corner of the world. Included is analysis data supporting design decisions. Format and content of interrogated data now becomes the customers choice as to how he wants to retain visibility of the data at point of use. For maintenance instructions, for instance, he may elect a paper media, or optical disk download, or elect to remain in an interrogation mode based on his particular need at the time. Also, actual tool cutting path and set up procedures, tool selection, machine compatibility and optimum combinations of machine and cutting tool now becomes a matter of distributed access as opposed to purchase of the information. As new MANTECH processes such as thermoplastics come on the scene, remanufacture or reprocurement alternatives will become viable alternatives to original manufacturing processes. As flexible manufacturing cells and systems begin to proliferate through our internal DoD depots and industry, alternatives to huge investments to stock, store and control billions of dollars in items begin to emerge to approach "Just in time" inventory objectives for both the manufacture and support of weapon systems.

Prime Vendor Tier Relationships: The late 70s early 80s saw the demise of the traditional "Primes". As distributed data bases, multi level encryption protocols, and super micros entered the scene, a blurring of traditional primes took place. Contractor teaming along with constrained DoD markets caused traditional primes to become active in the vendor tier to other primes. For every prime contract the traditional primes were awarded, there were 10 to 30 cases where the traditional prime was now a supplier to another "prime". The question of vertical integration became a major issue. It was simply too expensive to vertically integrate all elements of a weapon system design and manufacture. However, as the new primes began to move major

portions of the design and manufacture out into the vendor tiers, they also demanded that the vendors play on their resident CAD/CAM/CAE systems just as if they were vertically integrated into the prime operation. The vst proliferation of CAD/CAM/CAE systems that took place in the 70s gave way to communication protocols developed by NBS, GM, DEC, IBM, and major DoD traditional primes. The GM Manufacturing Automation Protocol (MAP) became the "Freddie Laker" standard by sheer weight of the market place. It was there that DoD began to understand that "If the prime can see it all through an integrated and distributed data base, so can the customer". The philosophy became a major source selection criteria in all weapon system development. From this approach draconian cost cutting became a reality. Design reviews that used to be expensive and time consuming now ere done "on the fly" without people traveling. Program managers began to contract for drawing release authority at major points in the design process. Provisioning data was bounced by the primes off of distributed data bases containing preferred items BEFORE provisioning conferences. What was left was new items and contractor recommended unacceptable items to be debated as proposed to the complete range of spares provisioning. There was a fundamental understanding that modern computer based design and manufacturing systems could bring a weapon system on line in "half the time - at half the cost - with quantum increases in design reliability". These three issues became user requirements and were fully supported in clear source selection criteria along with the constant, performance.

Appendix F

SHARED DATA

APPENDIX F
SHARED DATA - KEY TO ACHIEVING IMPROVED PRODUCTIVITY
THROUGH COMPUTER AIDED LOGISTIC SUPPORT

1. INTRODUCTION

The objective of this paper is to explore the aspects of logistic support data requirements for an emerging weapons system and to suggest a logical approach for transition from current information support systems of today to shared data structured systems of tomorrow.

The B-1B bomber was selected as a typical example of an emerging weapons system for this discussion because of its position in the development and deployment phase. Logistic data bases that are currently being developed will support this weapon system well into the next century. The current functional and informational data models for these logistic data bases are derived from a conceptual design study. This study, identified as the Integrated Design Support System (IDS), is required for the development of an advanced engineering support information system. The conceptual study was funded by the U.S. Air Force Wright Aeronautical Laboratory. The models developed under this study were focused on sustaining engineering support to B-1B design, manufacturing, depot and field support activities and are generic to many emerging weapons systems.

2. THE PRESENT (AS IS) LOGISTIC SUPPORT DATA ENVIRONMENT

Considerable industry and government attention has been focused on both the development and integration of automated business systems and on the development of computer-aided engineering systems. Little effort, however, has been applied to the integration of computer-aided engineering systems or to the design of systems to acquire, manage, and communicate graphical, alphanumeric, and textual data in various combinations. Research and development work has been performed on generic data base

management technology under the IPAD*, ICAMm, and ATI programs, but this technology has not been exploited on a broad level for the development and deployment of major weapon systems.

A wide range of technical support activities provide product technical data services from conceptual design through manufacturing, weapons sytem operations, and product retirement. A top level schematic of organizational technical support activities for the B-1B aircraft system development program is shown in Figure 1. The diagram is intended to depict sustaining engineering support activities that use engineering data directly such as manufacturing material review, repair, depot repair and design modifications. It should be noted that significant secondary uses of technical support data are not shown in the diagram such as training, maintenance provisioning, and operations mission analysis.

*IPAD - Integrated Programs for Aerospace Vehicle Design - NASA
ICAM - Integrated Computer Aided Manufacturing - USAF
ATI - Automated Technical Information - USAF

Current emphasis by both the government and industry is in the development of organizational rather than data-driven systems. In the development of a weapon system, the traditional technical support data bases that are passed on to the contracting agency are engineering drawings, specifications, and technical orders for maintenance support. The remaining technical data bases that reside with the contractor are significant. An example of structural technical support data bases for the B-1B is shown in Figure 2. It should be noted that a majority of digital and graphic data bases are considered private. These data bases are controlled by design and analysis support organizations and are not maintained as official released data.

There are a number of inplace and emerging logistic informational systems both at contractor and government facilities. An example of key Rockwell and government logistic systems that utilize or manipulate information is shown in

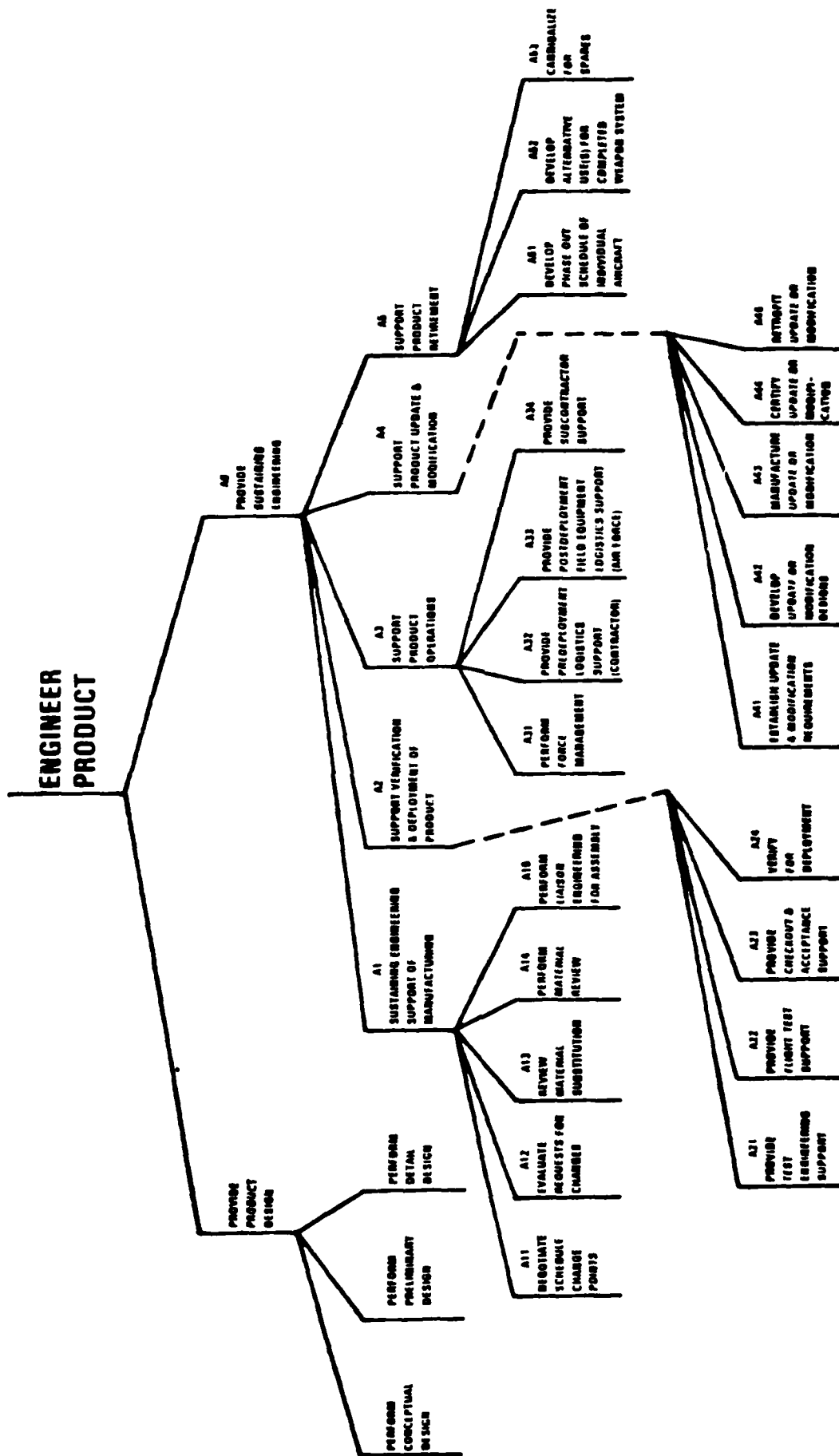


Figure 1 - B-1B. SUSTAINING ENGINEERING SUPPORT FUNCTIONS
(TOP LEVEL VIEW)

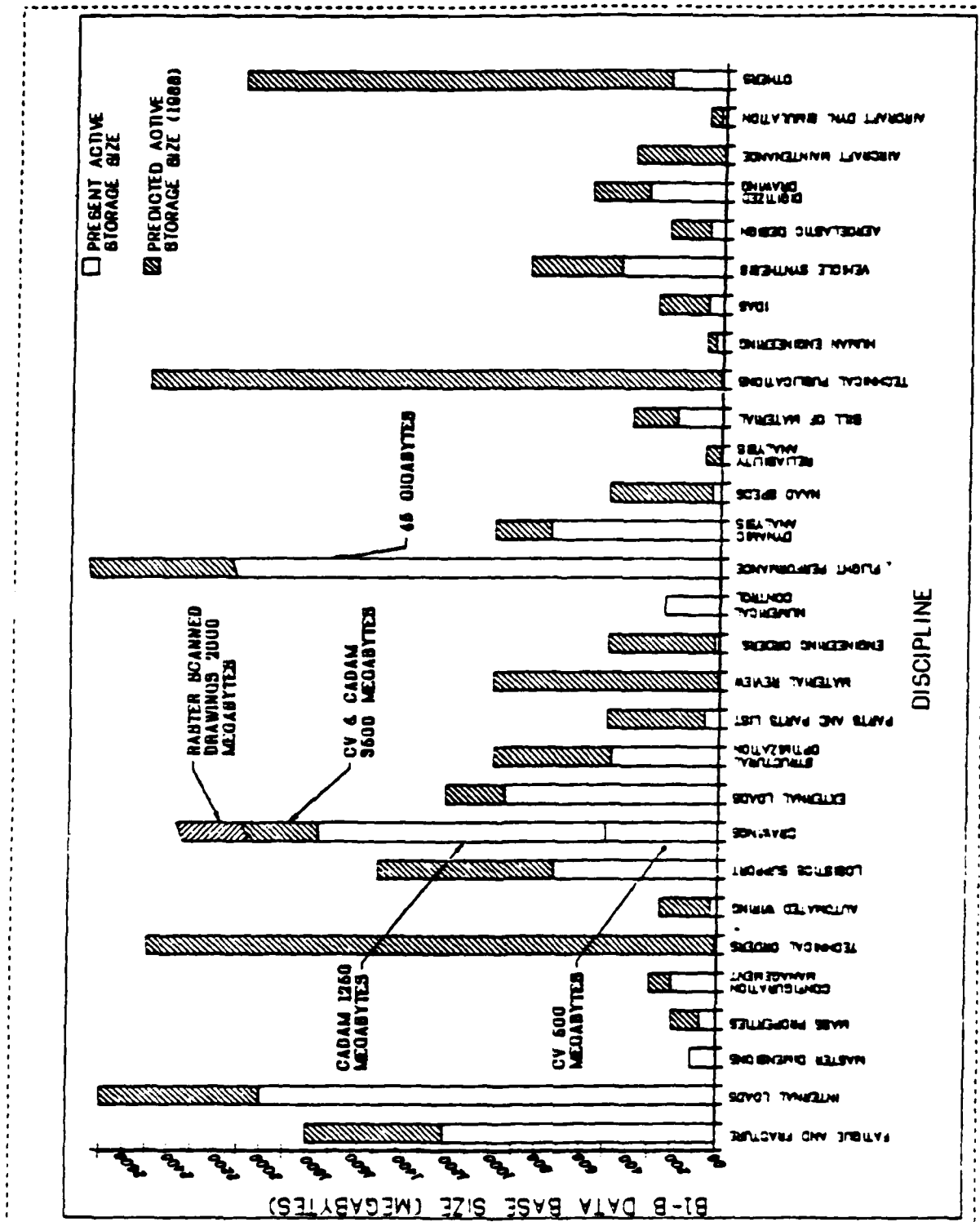


Figure 2. EXAMPLES OF KEY ENGINEERING SUPPORT DATA BASES

Figure 3. Today's technical support systems are generally hierarchical in nature, are transaction driven, and many operate in a batch environment. Data reside in a heterogeneous computer environment and are generally non-communicative between dissimilar computer systems. Specific problems and issues with today's heterogeneous logistic support information system environment are discussed in the following paragraphs.

While technical computer innovations and data system automation are progressing at an accelerated rate, integration through shared data is progressing slowly.

Information systems have not been developed from a data-driven approach, but rather from an organizational or application-driven approach. Present information systems serve discrete user needs. Redundant product support data must be maintained or recreated in many data bases.

Neutral data formats are being developed that address geometric and textual data communications between computers and graphic terminals. Two such systems are IGES and GENCODE. Development of these systems is currently evolving. Technology that is currently lagging involves heterogeneous data control and manipulation. This problem is partly due to the computer vendors and the competitive nature of industry and government functional organizations.

In the development of a weapon system, data are acquired in the form of discrete CDRL's (Contract Data Requirements List). Even though there is a determined relationship between many if not all of the data deliverables, such as drawings, specifications, and technical orders, the data are delivered to government organizations and stored as separate data systems. These information systems include paper, micro-fiche and magnetic storage mediums. Even though transition to digitized data bases is occurring, the prevailing mentality of information management remains in the paper medium.

Rockwell Management and Data Systems

LDMS - Logistics Management Data System
LSDS - Logistics Support Data System
PIOMS - Provisioned Item Order Management System.
SEMIS - Support Equipment Management Information System
TOTS - Technical Order Tracking System
LIMS - Logistics Inventory Management System
ICSIS - Interim Contract Support Information System
MCC-ICS - Management Control Center Interim Contract Support
MCS Boeing - Management Control System
CETS - Contract Engineering Technical Support System
IDS - Integrated Design Support System
CITS - Central Integrated Test System Ground Processing System
EACN - Emergency Airborne Communications Network

US Air Force Management and Data Systems

CAMS - Core Automated Maintenance System
OMS - Logistics Management System
LOC - Logistics Operations Center
IMMS - Integrated Maintenance Management System comprising
MICAP, MDC, AWP, and AVISURS
CMS - Combat Maintenance System
WSMIS - Weapon System Management Information System
SAC - Strategic Air Command Operational Data
MICAP - Mission Capability System
MDC - Maintenance Data Collection
AWP - Awaiting Parts System
AVISURS - Aerospace Vehicle Inventory, Status and Utility
Reporting System

Figure 3.
SELECTED MAINTENANCE LOGISTICS SUPPORT DATA SYSTEMS
CONTRACTOR AND GOVERNMENT

Present government automated logistic technical data base development programs (EDCARS* - computer based drawings, and ATOS-automated tech orders) do not address the aspects of shared data outside of their own application. Furthermore, government logistic support organizations have not developed overall strategies for dealing with new digitized design and analysis data bases that are required for long term logistic support of major weapon systems. Examples of such data bases are referenced in Figure 3.

Current trends encouraged by the Air Force Logistics Command to consider the logistic implications of a weapon system at design time can be expected to continue. However, the attitude of both the customer and the system designer must change for this to be the case. The customer (the Air Force in this instance) must not only encourage the contractor to design supportability into the system, but must also be ready to fund the additional effort this requires. Once chartered by the conditions of the contract, the system designer must be as creative and as innovative as possible in anticipating the future requirements of the weapon system, not only from the operational point of view, but from the damage repair and maintenance point of view as well, a not inconsequential challenge considering the complexity and sophistication of today's weapons.

The computer offers the maximum opportunity to support the system designer in accomplishing ambitious design goals. Hardware manufacturers can be expected to deliver increasingly sophisticated tools for storage, computation and manipulation of data. Trends in firming up programmed engineering design rules and processes by means of reducing them to PROMs and EPROMs and offering this capability at the touch of a key will also continue. Software houses will continue to provide the engineer with an increasingly capable array of data base management systems designed for more flexibility at less cost with more reliability.

"Where is the challenge, then?" one may ask. In a word, the challenge is in the data. The management of this critical asset poses a challenge equal to the technology which conceived it. The subtlety of the challenge is that few people intuitively appreciate the magnitude and complexity of the data problem.

The system designer may perceive the major problem to be addressed as a computational problem and only incidentally a data problem. After all, shouldn't the data be regarded as a given? From the individual designer point of view the data might be regarded as something solely personal and individual, but a moments reflection dispels this notion. The conventional view has it that when the design data are firmed up, they can be released and configuration management imposed on them. This has worked reasonably well for the manufacturing and downstream functions of the contractors and subcontractors before delivery of the system to DoD, who must now service, maintain and repair the system in an operational environment. Many years or even decades later, after numerous repairs and modifications have been implemented on the system, the original design data may have been lost, the original manufacturer may no longer be in the same business, and design assumptions and hypotheses may have to be guessed at.

Will this situation suffice for the weapons systems of today as these systems age in operational service? The computer offers the mechanism with its ability to store and manipulate vast amounts of data with acceptable speed. Data, defined at the attribute class level, documented as supporting a particular function in the data model, and available from a shared source on a node of a heterogeneous network utilizing secure communications seem to offer a necessary and required asset, one which is lacking in todays logistics environment.

*EDCARS - Engineering Data Collection and Retrieval System (USAF)
ATOS - Automated Technical Order System - USAF

3. FUTURE (TO BE) LOGISTIC SUPPORT INFORMATION SYSTEMS

The "To Be" world addressed by the IDS system envisions a scenario similar to the one described above, and work is starting on the disciplining of the data. The current world seems to be "forms" driven, there is a form for everything, and everything has its form. Forms are a necessity in a paper environment. How else to assure the completeness of the data or their location in the manual filing systems of yesterday (and, unfortunately of today)? The electronic world can be forms independent and offer flexibility undreamed of in a paper based media. But much needs to be accomplished in the science (or art) of managing the data world of tomorrow and it is just now being formulated. It includes developing a listing of approved class words, key words and modifiers -- in other words, classification and coding of data. The use of this device will attempt to bring order in the dictionary as attributes and entities are gathered across the vast range of functional activities served by the (IDS) system.

The key to achieving future DoD productivity in weapon system support is in the development of data-driven rather than organizational-driven systems. Future logistic information systems need to address the following issues:

- o Reconfiguration of contractor and DoD structure and organizational policies
- o User and application design "ad hoc" queries
- o Total product support rather than individual CDRL's
- o Heterogeneous data base managers on heterogeneous computers
- o Hardware-oriented data base machines
- o Versatile generative combinations of data elements
- o Effective classification and coding schemas

The development of computer-aided logistics support should be an orderly, evolutionary process with appropriate DoD component service policy guidance and successful resolution of

key technical issues. The policy will be required to address three key issues:

1. Commitment to a broad program architecture that will permit development in a systematic manner.
2. The integration of developing data base management technologies into rapidly maturing CAD/CAM/CAE technologies.
3. The establishment of requirements for future weapon system designs to support automated logistics data collection activities necessary for emerging support concepts.

Key technical issues must be addressed through the extension of evolving information system concepts and, in some instances, new concept developments. Influencing the standards environment to achieve a compatible hierarchy of standards is necessary for handling the full range of logistics data in digital format.

A key to the success of computer-aided logistics support is the ability to develop an information model for logistics. Today, each logistics data requirement is like looking at the weapons through a know hole - not seeing the whole and not having data relatable to other data. Data base concepts will be required to accommodate both man/machine and machine/machine users. Data storage has to be viable for the life of the weapons system (30 years plus). The integration of data types (i.e., text, graphics, tables, math models, etc.) has to be achieved to preserve information context. Information management concepts for access and integrity control throughout a wide-spread network of users will present a challenge.

Logistics data can be expected to transition from information (the "what") to knowledge (the "how") in recognition of the capability to capture an embedded knowledge base in the design and manufacture of a weapons system and in the

deployment and operation of weapons systems. The embedded knowledge will be more accessible as computer assistance becomes inherent in the processes that build and operate future weapon systems.

The first tangible product in computer-aided logistics support is the deployment of a "kernel" logistics information system. Such a system will require a concept for a logistics data base. Once the "kernel" system is deployed, new analytical software will evolve for every element. This software will provide capability beyond currently available tools as it incorporates access to new data base resources.

Government systems will require upgrade to accept digital format logistics data. New contracting vehicles will be required to define, specify and receive digital logistics products.

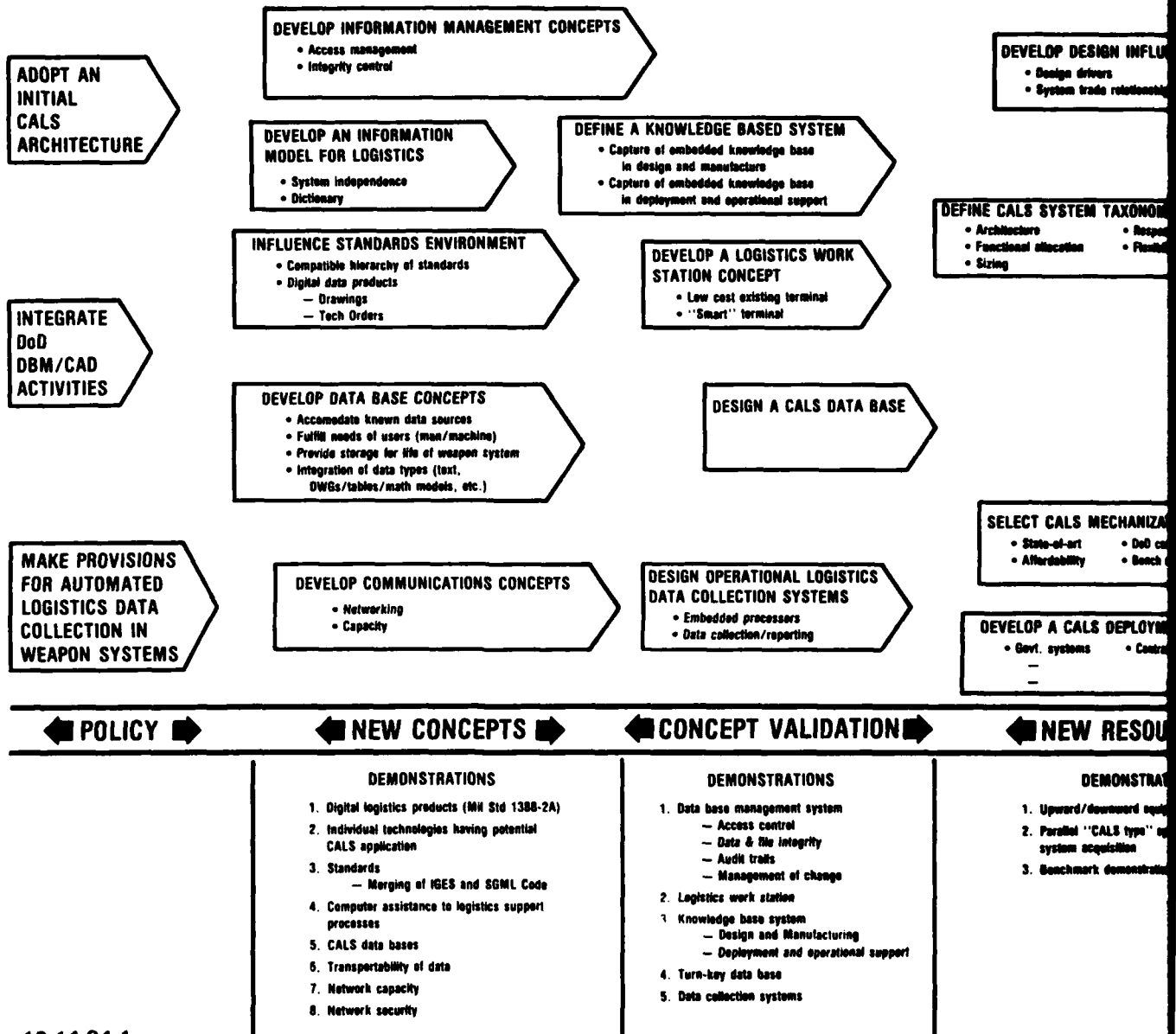
The above is at best only a glimpse into the new frontiers that can be achieved through computer-aided logistic support. A time phase road-map of capability with some key technical demonstrations are shown in Figure 4. This is intended to show general direction and is not a specific plan. What is described in Figure 4 is a major undertaking involving coordination throughout DoD and the defense industry.

4. INTEGRATED DESIGN SUPPORT SYSTEM (IDS) TECHNOLOGY WEDGE

The U.S. Air Force Human Resources Laboratory (HRL) and a coalition of USAF and technology subcontractors headed by Rockwell International are currently developing and prototyping and advanced information technology system called IDS.

The objective of the IDS program is to design, develop, construct and demonstrate a prototype information management system that will provide capability to efficiently capture, manage, and distribute key digital technical data across the entire life span of major Air Force Weapons systems (see Figure 5).

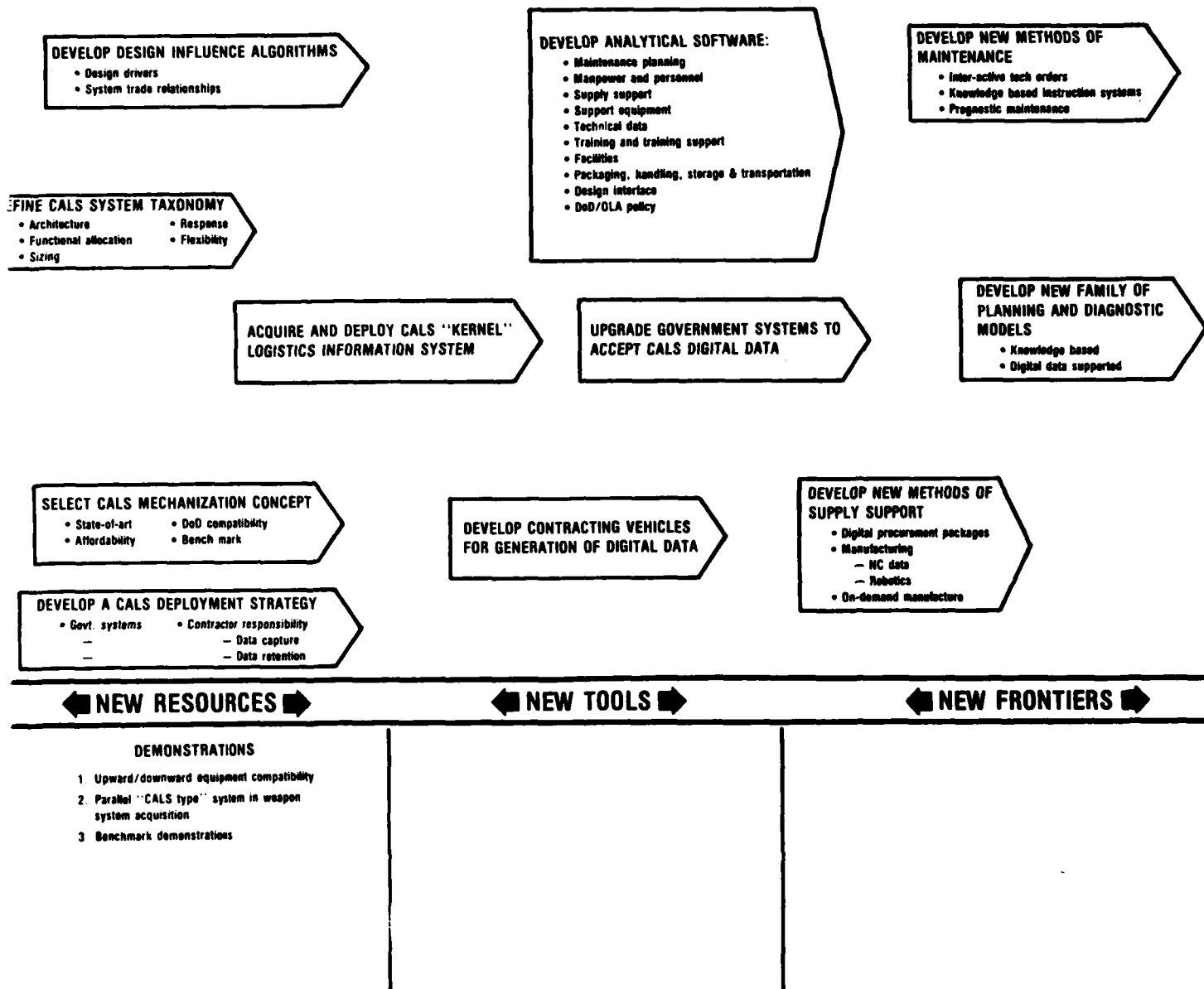
EVOLUTIONARY COMPUTER AID



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Figure 4. EVOLUTIONARY DEVELOPMENT OF COMPUTER AID

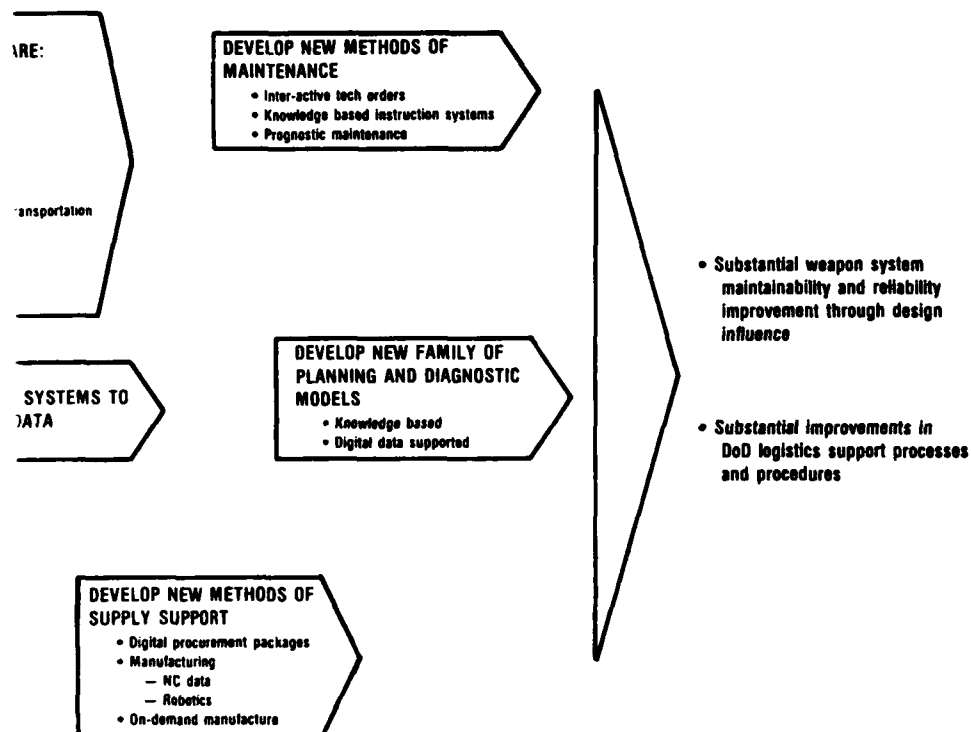
EVOLUTIONARY DEVELOPMENT OF COMPUTER AIDED LOGISTICS SUPPORT (CALS)



COMPUTER AIDED LOGISTICS SUPPORT (CALS)

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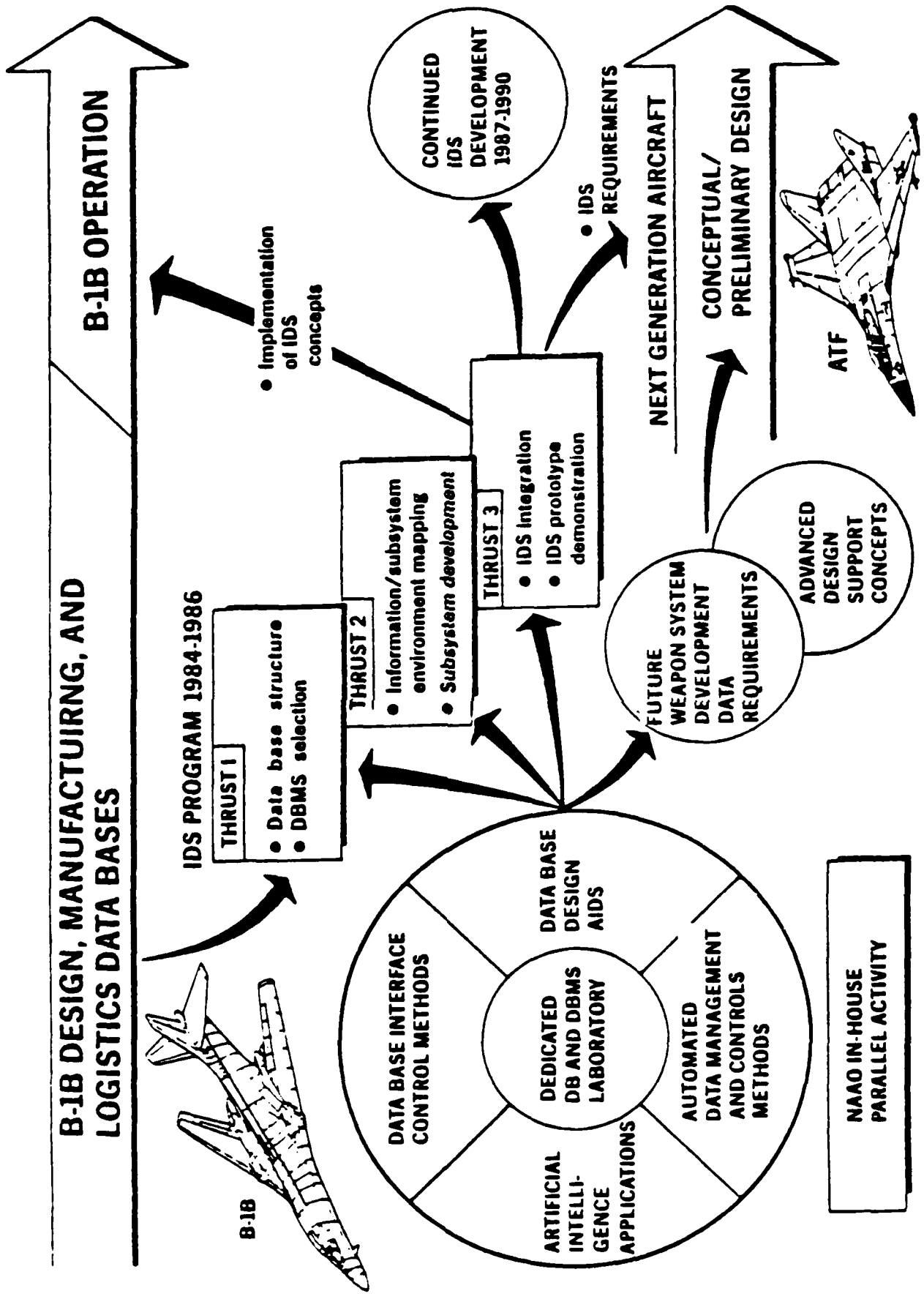


Figure 5. IDS DEVELOPMENT PROGRAM RELATIONSHIPS

The major IDS program challenges and goals are summarized below:

- (1) To develop a prototype IDS system that will demonstrate integration of state-of-the-art and emerging technology to manage technical data in a heterogeneous computer and functional environment (Figure 5).
- (2) To develop engineering functional and information models that provide complete understanding of data and activity structure from conceptual design to product retirement for a major, emerging military large aircraft system.
- (3) To construct, build, and demonstrate a flexible IDS prototype system that can be rapidly expanded as new technologies emerge in the areas of data base machines, advanced design and analysis graphics, advanced communications, and artificial intelligence.
- (4) To assure that the system design reflects capability for upward migration and portability.
- (5) To develop the IDS concept in a production environment that will provide a realistic test bed for requirements definition, prototyping, initial build, and demonstration.
- (6) To structure the IDS design so as to facilitate transition of the system from the research and development and prototype stages into a production system.
- (7) To demonstrate and prototype IDS in a manner that will provide the baseline for future technical information management on all Air Force weapon systems.
- (8) To formulate draft requirements to be used as a baseline for establishing technical data requirements for future Air Force Systems.

Rockwell is also involved with the Analytical Sciences Corporation of Reading, Massachusetts in the initial phase of an Air Force program to develop and implement a B-1B Logistics Technical Support Center (TSC). This program will establish a management and technical center for Air Force logistic support for the B-1B weapon system. The center will also provide operational/readiness status capability to the Air Logistics Center (ALC) B-1B system manager and will provide technical information support between contractor, depot, and operational repair facilities.

The IDS will provide advanced data base management and communications concepts in support of the TSC. Advanced prototypes of the IDS (Advanced Information Management Concepts) and the Technical Support Center (advanced control and technical communication concepts) are scheduled for fiscal 1986.

5. SUMMARY

The United States Air Force is stepping beyond traditional methods of data base management in the IDS program. More powerful microcomputers and data base machines, new data and information models, and the effective use of distributed data in a heterogeneous environment are all part of this research effort. IDS could well prove to be the data base solution that everyone is looking for. If so, the significance of IDS could be tremendous, resulting in replacement of more standard data structures and thereby reducing computer and storage costs and providing networking between dissimilar computer systems. Every government agency, as well as all of industry, needs this capability. The IDS program will prove the concepts workable in a prototype system before transferring these developments to production systems.

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Joseph Arcieri Deputy Director, DoD Weapon Support Improvement and Analysis Office 1400 Two Skyline Place 5203 Leesburg Pike Falls Church, VA 22041	1
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Department of the Army

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Edwin Greiner Assistant Deputy for Materiel Readiness, AMC Room 10S06 5001 Eisenhower Avenue Alexandria, VA 22333-0001	1
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Howard Rojewski 1
AMC - ALMSA
210 N. Tucker Boulevard
P. O. Box 1578
St. Louis, MO 63188

LTC Steve Tracy 1
HQ U.S. Army
DACS-DMP
Rm. 1C460, The Pentagon
Washington, DC 20310

LT GEN Benjamin F. Register, Jr. 1
DCS/Logistics
DALO-ZA
Rm. 3E560, The Pentagon
Washington, DC 20310

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AMMRC, DRZMR-M
405 Arsenal Street
Watertown, Maine 02172

Commanding General
ARDC(D)
Dover, NJ 07801-5001

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Army Materiel Command AMCRE-C
5001 Eisenhower Avenue
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Department of the Navy

Emerson Cale 1
Deputy Director for Logistics Plans
Chief of Naval Operations
Room 4B546, The Pentagon
Washington, DC 20250

Dave Sherin 1
Director, Logistics R&D
NAVSUP 033
Room 606, Crystal Mall 3
Washington, DC 20376

Ernest Glauberson
NC3, Room 6W44
PMS 309
NAVSEA
Washington, DC 20362-5100

Bill Gorham
NAVSUP 033
Room 606, Crystal Mall 3
Washington, DC 20376

Mr. Frank Swofford
Director, Aviation and Ordnance Programs
Department of the Navy
120 Crystal Plaza 5
2211 Jefferson Davis Highway
Arlington, VA 22202

Albert S. J. Knight, II
Computer Integrated Engineering
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Naval Ocean Systems Center
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Navy Surface Weapon System
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Department of the Air Force

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AFALC/CCX
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Deputy for Supply and Maintenance
SAFAL - Room 4D865, The Pentagon
Washington, DC 20250

COL Donald C. Tetmeyer
AFHRL/LR
Bldg. 190, Area B
Wright-Patterson AFB, Ohio 45433

1

Nick Bernstein
AFWAL/FIBR
Building 45
Wright-Patterson AFB, Ohio 15433

1

Neil Christianson
AF/RDXM, Engineering Data Standards
Room 4E317, The Pentagon
Washington, DC 20250

1

Mr. Gerald Shumaker
AFWAL/MLTC
Wright-Patterson AFB, OH 45433

1

Terry Granger
AFALC/PTL
Wright-Patterson AFB, Ohio 45433

1

COL Hondo Hernandez
Ass't. DCS/Product Assurance
and Acquisition Logistics
HQ Air Force Systems Command
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1

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AFALC/PTAA
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Area B, Bldg 190
Wright-Patterson AFB, Ohio 45433

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Wright-Patterson AFB, OH 45433

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Wright-Patterson AFB, OH 45433

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Other Government Agencies

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Private Industry

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Mr. Richard C. Banta Logistics Systems Department Integrated Logistics Support Division Westinghouse Defense and Electronics Center 1111 Schilling Road - MS 7906 Hunt Valley, MD 21031	1
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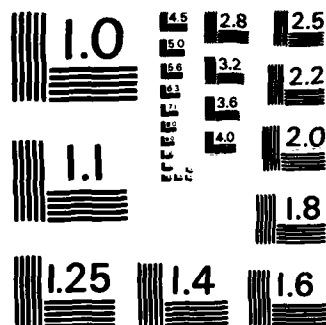
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John Anderson Boeing Aerospace P. O. Box 3707, Mail Stop 03-80 Seattle, WA 98124	1
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Bob Gulcher Vice President, Research and Development Rockwell International Dept. 101-GB-08 P. O. Box 92098 Los Angeles, CA 90009	1
Jack Osborn Structural Dynamics Research Corporation 2000 Eastman Drive Milford, OH 45150	1
Patrick M. Dallosta Logistics Engineering Associates, Inc. P. O. Box 3357 Annapolis, MD 21403	1
R. Thomas Moore, Jr., CPL Vice President, Operations Logistics Management Engineering, Inc. P. O. Box 3318 Annapolis, MD 21403	1
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Jim Stemple EDS Crystal Square 2 Suite 912 1725 Jefferson Davis Highway Arlington, VA 22202	1
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Mr. Robert Nemmers General Electric Company 12030 Sunset Hills Road Reston, VA 22090	1
Donald G. Buxton Assistant Program Manager for Integrated Logistics Support TRW, Inc. 7600 Colshire Drive McLean, VA 22102	1

Other

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